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E.T.R.  
5-16-08

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REPORT OF  
AIR POLLUTION SOURCE TESTING  
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM  
OPERATED BY STERIS ISOMEDIX SERVICES  
IN WAUKEGAN, ILLINOIS  
ON MAY 16, 2008

**FILE IN  
ORANGE**

HJ

Submitted to:

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
Compliance Section (#40)  
P.O. Box 19276  
Springfield, Illinois 62794-9276

**RECEIVED**  
JUL 16 2008  
Environmental Protection Agency  
Bureau of Air  
STATE OF ILLINOIS

(A)

JL gpa

Submitted by:

STERIS Isomedix Services  
1160 South Northpoint Boulevard  
Waukegan, Illinois 60085

Permit Application #: 07100007  
Facility I.D. # 097190AFG

IEPA-DIVISION OF RECORDS MANAGEMENT  
RELEASABLE

DEC 13 2012

Prepared by:

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Prepared on:

June 30, 2008

ECSi

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## **1.0 INTRODUCTION**

On Friday, May 16, 2008, ECSi performed air pollution source testing of an ethylene oxide (EtO) emission-control system operated by STERIS Isomedix Services in Waukegan, Illinois. The control device tested included one catalytic oxidizer, which is used to control emissions from two aeration rooms.

## **2.0 EQUIPMENT**

The gas-sterilization system is comprised of ten batch-cycle sterilization chambers, each discharged through a vacuum pump to a multi-stage scrubber system. Sterilized product is transferred into two aeration rooms, both discharged to a catalytic oxidizer emission control device. The gas-sterilization and emission-control equipment that was tested consists of the following:

- Two aeration rooms, each comprised of a heated aeration chamber and a chamber exhaust system.

Emissions from the aeration process are controlled by:

- One catalytic oxidizer emission control device, equipped with a prefilter, a 5 mmBtu/hr natural gas-fired burner, a reactive catalyst bed, and an exhaust blower.

### **3.0 TESTING**

EtO source testing was performed in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the catalytic oxidizer during aeration. A total of three aeration-phase test runs were performed for the catalytic oxidizer.

During aeration-phase testing, EtO emissions at the inlet and the outlet of the catalytic oxidizer were determined using direct source sample injection into the gas chromatograph (GC). All aeration testing was performed with freshly sterilized product in the aeration rooms.

## **4.0 RULE/COMPLIANCE REQUIREMENTS**

The catalytic oxidizer was tested to determine compliance with both USEPA requirements and with the conditions established in the Air Quality Permit granted to STERIS Isomedix Services by the Illinois EPA (IEPA). Testing was performed to demonstrate compliance with the following requirement::

- Ethylene oxide emissions to the atmosphere from each aeration room vent shall be reduced to a maximum concentration of 1 ppmv or by at least 99 percent, whichever is less stringent, from each aeration room vent.

## **5.0 TEST METHOD REFERENCE**

### **5.1 INTRODUCTION**

EtO source testing was conducted in accordance with the procedures outlined in USEPA CFR40, Part 63.365. EtO emissions monitoring was conducted simultaneously at the inlet and outlet of the catalytic oxidizer during the aeration. A total of three aeration-phase test runs were performed for the catalytic oxidizer.

During aeration-phase testing, EtO emissions at the inlet and the outlet of the catalytic oxidizer were determined using direct source sample injection into the gas chromatograph (GC). All aeration testing was performed with freshly sterilized product in the aeration rooms.

Operation and documentation of process conditions were performed by personnel from STERIS Isomedix Services using existing monitoring instruments installed by the manufacturer of the equipment to be tested. In accordance with IEPA requirements, and the procedures established in USEPA CFR40, Part 63, Subpart O, the following parameter was recorded: catalyst bed operating temperature for the catalytic oxidizer.

### **5.2 VOLUMETRIC FLOW MEASUREMENT**

Exhaust gas flow at the outlet of the scrubber was determined by EPA Method 2C using a standard pitot tube and an inclined-oil manometer. Sampling ports were installed in accordance with EPA Method 1, and are located far enough from any flow disturbances to permit accurate flow measurement.

Temperature measurements were obtained from a type K thermocouple and thermometer attached to the sampling probe. Exhaust gas composition was assumed to be air and small amounts of water vapor. Water vapor was negligible, at about 3 percent.

### **5.3 CONTROL EFFICIENCY AND MASS EMISSIONS MEASUREMENT**

During aeration phase testing, EtO emissions at the inlet and outlet of the catalytic oxidizer were determined using direct source sample injection into the GC. The mass of EtO discharged to the inlet and from the outlet was determined using the equation shown below in Section 5.9. Mass-mass control-efficiency of EtO during aeration was calculated by comparing the mass of EtO vented to the catalytic oxidizer inlet to the mass of EtO vented from the catalytic oxidizer outlet.

During aeration, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) was used to quantify inlet EtO emissions, and a photoionization detector (PID) was used to quantify low-level EtO emissions at the emission-control device outlet.

#### **5.4 SAMPLE TRANSPORT**

Source gas was pumped to the GC at approximately 1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the inlet, the sampling port was located in the common discharge duct, immediately upstream of the catalytic oxidizer. At the outlet of the catalytic oxidizer, sampling ports were located in the exhaust stack.

#### **5.5 GC INJECTION**

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately five-minute intervals during aeration testing. Helium was the carrier gas for both the FID and PID.

#### **5.6 GC CONDITIONS**

The packed columns for the GC were both operated at 80 degrees C. The columns were stainless steel, 6 feet long, 0.125 inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B.

During the analysis, the FID was operated at 250 degrees C. The support gases for the FID were hydrogen (99.995% pure) and air (99.9999% pure). Any unused sample gas was vented from the GC system back to the inlet of the control device being tested.

## **5.7 CALIBRATION STANDARDS**

The FID was calibrated for low to mid-range part-per-million-by-volume (ppmv) level analyses using gas proportions similar to the following:

- 1) 100 ppmv EtO, balance nitrogen
- 2) 50 ppmv EtO, balance nitrogen (audit gas)
- 3) 10 ppmv EtO, balance nitrogen
- 4) 1 ppmv EtO, balance nitrogen

The PID was calibrated for low-range ppmv level analyses using gas proportions similar to the following:

- 1) 100 ppmv EtO, balance nitrogen
- 2) 50 ppmv EtO, balance nitrogen (audit gas)
- 3) 10 ppmv EtO, balance nitrogen
- 4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix F.

## **5.8 SAMPLING DURATION**

Aeration phase EtO measurements were taken for a 60-minute time period for each test run. Since aeration is a 24-hour process at this facility, aeration testing consisted of a total of three 1-hour test runs, performed after freshly sterilized product had been transferred into the aeration process.

## **5.9 CONTROL-EFFICIENCY/MASS-EMISSIONS CALCULATIONS**

Mass emissions of EtO during aeration were calculated using the following equation:

$$\text{MassRate} = (\text{VolFlow})(\text{MolWt})(\text{ppmv EtO}/10^6)/(\text{MolVol})$$

Where:

MassRate = EtO mass flow rate, pounds per minute  
VolFlow = Corrected volumetric flow rate, standard cubic feet per minute at 68 degrees F  
MolWt = 44.05 pounds EtO per pound mole  
ppmv EtO = EtO concentration, parts per million by volume  
 $10^6$  = Conversion factor, ppmv per "cubic foot per cubic foot"  
MolVol = 385.32 cubic feet per pound mole at one atmosphere and 68 degrees F

Mass-mass control efficiency of EtO was calculated for aeration. Results of the control-efficiency and mass emissions testing are presented in Section 8.0 and in Tables 1 and 2.

## **6.0 TEST SCENARIO**

All aeration testing was performed with freshly sterilized product in the aeration rooms. A total of three aeration phase test runs were performed. The testing schedule was as follows:

- 1) Testing equipment was set up and calibrated.
- 2) Aeration Phase Test Run #1 was performed. Sampling was conducted at the inlet and the outlet of the catalytic oxidizer.
- 3) Aeration Phase Test Run #2 was performed. Sampling was conducted at the inlet and the outlet of the catalytic oxidizer.
- 4) Aeration Phase Test Run #3 was performed. Sampling was conducted at the inlet and the outlet of the catalytic oxidizer.
- 5) Post calibration check was performed, testing equipment was packed.

## **7.0 QA/QC**

### **7.1 FIELD TESTING QUALITY ASSURANCE**

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the heated sampling line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device which produces carbon dioxide and water vapor. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

### **7.2 CALIBRATION PROCEDURES**

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a point-to-point calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix F.

## **8.0 TEST RESULTS**

The Anguil Catalytic Oxidizer demonstrated an EtO control efficiency of 99.81 percent for the control of aeration emissions. Illinois EPA requirements specify that ethylene oxide emissions to the atmosphere from each aeration room vent shall be reduced to a maximum concentration of 1 ppmv or by at least 99 percent, whichever is less stringent, from each aeration room vent. The emission-control device met this requirement.

The test results are summarized in Tables 1 and 2. Chromatograms and chromatographic supporting data are attached as Appendices A through D. Copies of field data and calculation worksheets are attached as Appendix E.

## **TABLES**

**TABLE 1**  
**ETHYLENE OXIDE CONTROL EFFICIENCY - AERATION**  
**OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE (CATALYTIC OXIDIZER)**  
**OPERATED BY STERIS ISOMEDIX SERVICES**  
**IN WAUKEGAN, ILLINOIS**  
**ON MAY 16, 2008**

<u>RUN NUMBER</u>	<u>INJECTION TIME</u>	<u>INLET ETO CONC. (PPM)(1)</u>	<u>OUTLET ETO CONC. (PPM)(2)</u>	<u>ETO CONTROL EFFICIENCY</u>
1(3)	1121	56.8	0.20	99.6479
1	1126	52.5	0.08	99.8476
1	1131	52.8	0.13	99.7538
1	1136	53.2	0.17	99.6805
1	1141	50.4	0.17	99.6627
1	1146	52.6	0.05	99.9049
1	1151	56.1	0.12	99.7861
1	1156	53.3	0.01	99.9812
1	1201	59.1	0.10	99.8308
1	1206	57.3	0.14	99.7557
1	1211	54.2	0.04	99.9262
1	1216	55.3	0.10	99.8192
2(4)	1221	55.4	0.06	99.8917
2	1226	54.8	0.12	99.7810
2	1231	53.3	0.13	99.7561
2	1236	50.6	0.05	99.9012
2	1241	51.7	0.06	99.8839
2	1246	50.0	0.09	99.8200
2	1251	49.9	0.07	99.8597
2	1256	53.0	0.11	99.7925
2	1301	48.8	0.09	99.8156
2	1306	45.4	0.16	99.6476
2	1311	48.7	0.07	99.8563
2	1316	50.0	0.07	99.8600
3(5)	1321	53.2	0.11	99.7932
3	1326	50.2	0.10	99.8008
3	1331	47.7	0.01	99.9790
3	1336	48.0	0.08	99.8333
3	1341	49.2	0.15	99.6951
3	1346	48.9	0.25	99.4888
3	1351	48.2	0.09	99.8133
3	1356	47.8	0.08	99.8326
3	1401	47.2	0.11	99.7669
3	1406	44.0	0.08	99.8182
3	1411	47.3	0.01	99.9789
3	1416	46.6	0.12	99.7425
<b>TIME-WEIGHTED AVERAGE:</b>		<b>51.21</b>	<b>0.0994</b>	<b>99.8057</b>
<b>IEPA REQUIRED CONTROL EFFICIENCY:</b>				<b>99%</b>

Notes:

- (1) - PPM = parts per million by volume
- (2) - 0.01 ppm is the quantification limit for the detector used at the outlet.
- (3) - Aeration Phase Test Run #1 started at 11:18, ended at 12:18.
- (4) - Aeration Phase Test Run #2 started at 12:18, ended at 13:18.
- (5) - Aeration Phase Test Run #3 started at 13:18, ended at 14:18.

**TABLE 2**  
**ETHYLENE OXIDE MASS EMISSIONS**  
**FROM AN ETHYLENE OXIDE EMISSION CONTROL DEVICE (CATALYTIC OXIDIZER)**  
**OPERATED BY STERIS ISOMEDIX SERVICES**  
**IN WAUKEGAN, ILLINOIS**  
**ON MAY 16, 2008**

<b>EMISSIONS <u>STREAM</u></b>	<b>STACK <u>FLOW(1)</u></b>	<b>OUTLET ETO <u>MASS FLOW(2)</u></b>	<b>MINUTES/ <u>CYCLE</u></b>	<b>CYCLES/ <u>YEAR</u></b>	<b>ANNUAL ETO <u>MASS EMISSIONS(3)</u></b>
Aeration	15000 DSCFM	0.000155 lbs/min	60	8760	81.56 lbs/year
<b>TOTAL ANNUAL ETO MASS EMISSIONS</b>					<b>81.56 lbs/year</b>

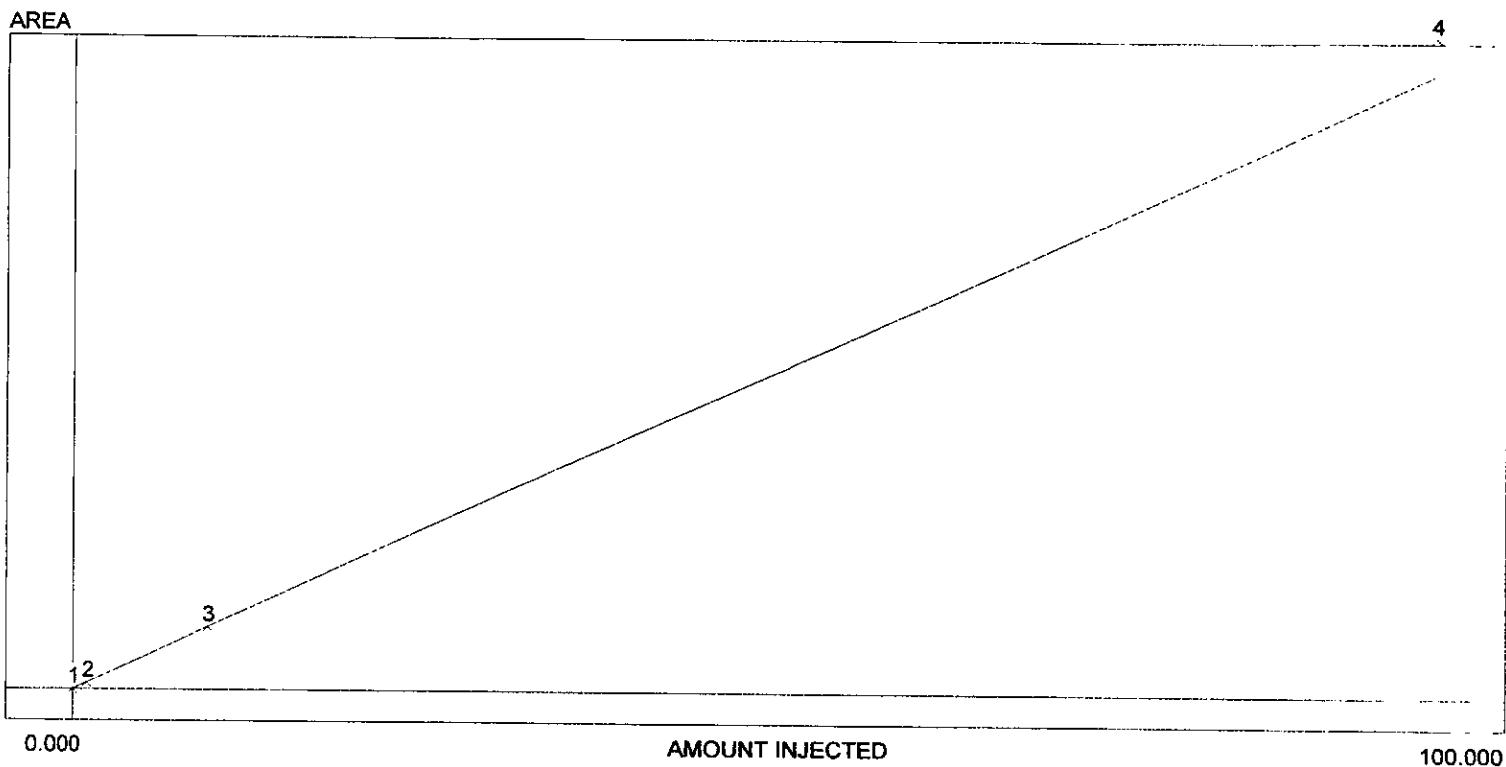
Notes:

- (1) - DSCFM = Dry Standard Cubic Feet per Minute
- (2) - lbs/min = pounds per minute
- (3) - lbs/year = pounds per year

## **APPENDICES**

**APPENDIX A**  
**Calibration Data**

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.350		0.000	
2	Ambient H2O	0.350	0.580		0.000	
3	Ethylene Oxide	0.580	0.700	1SterisWaukegan	0.000	ppm
4	Acetaldehyde	0.700	0.800		0.000	
5	CO2	0.800	1.000		0.000	



Avg slope of curve: 3.39

Y-axis intercept: 0.00

Linearity: 1.00

Number of levels: 4

SD/rel SD of CF's: 1.7/67.0

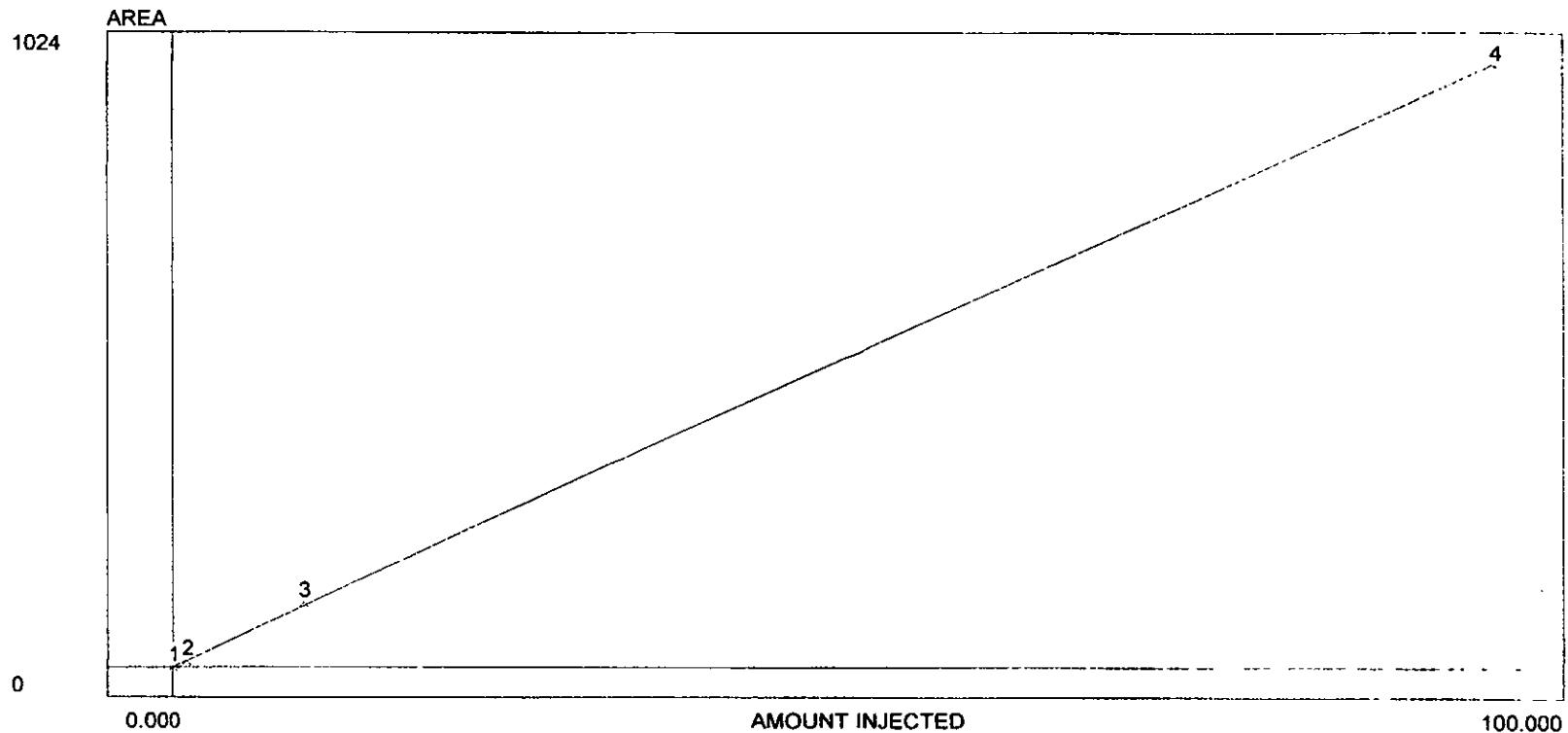
$Y=3.3920X$

r<sup>2</sup>: 1.0000

Last calibrated: Fri May 16 11:09:02 2008

Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	3.520	1.100	3.200	3.520	N/A	N/A
3	34.200	10.100	3.386	34.200	N/A	N/A
4	359.000	100.000	3.590	359.000	N/A	N/A

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.350		0.000	
2	Ambient H2O	0.350	0.520		0.000	
3	Ethylene Oxide	0.520	0.730	2SterisWaukegan	0.000	ppm
4	Acetaldehyde	0.720	0.800		0.000	
5	CO2	0.800	1.000		0.000	



Avg slope of curve: 10.24

Y-axis intercept: 0.00

Linearity: 1.00

Number of levels: 4

SD/rel SD of CF's: 5.1/66.9

Y=10.2398X

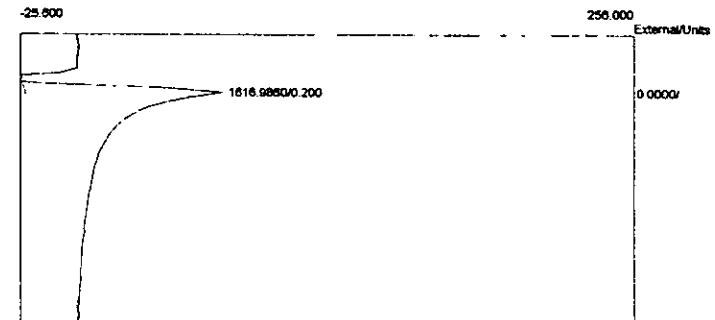
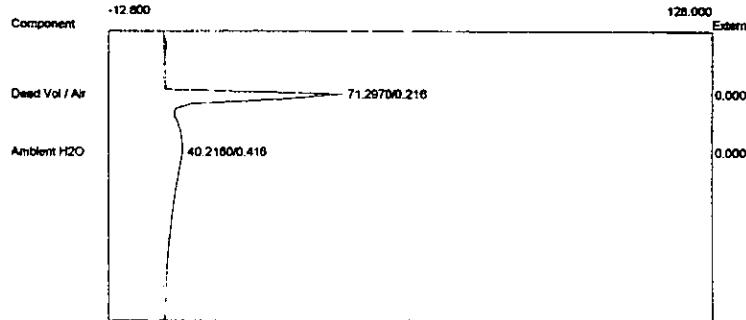
r<sup>2</sup>: 1.0000

Last calibrated: Fri May 16 11:09:42 2008

Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.000	0.000	0.000	0.000	N/A	N/A
2	10.700	1.100	9.727	10.700	N/A	N/A
3	109.000	10.100	10.792	109.000	N/A	N/A
4	1020.000	100.000	10.200	1020.000	N/A	N/A

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 09:54:38  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan-Amb.CHR (c:\peak359)  
 Sample: Ambient Background  
 Operator: D. Kremer

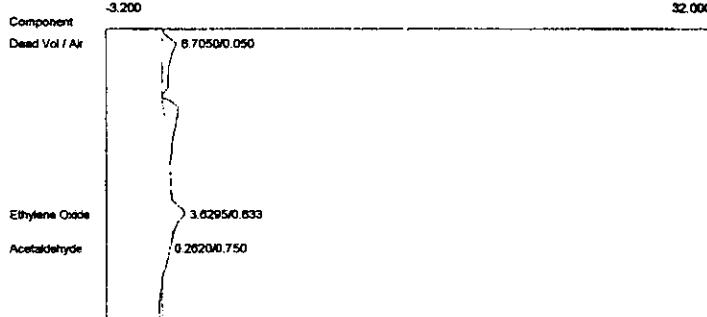
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 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 09:54:38  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan-Amb.CHR (c:\peak359)  
 Sample: Ambient Background  
 Operator: D. Kremer



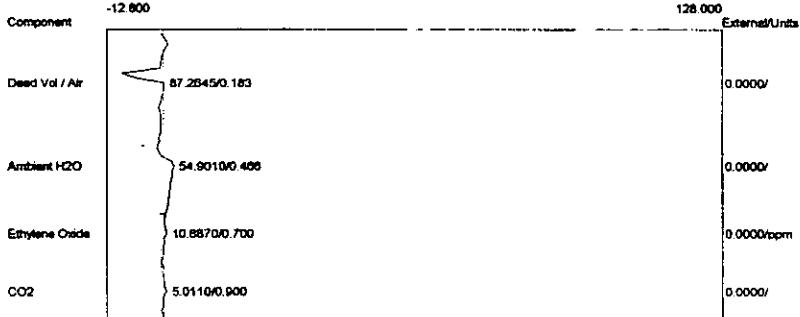
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	71.2970	0.0000	
Ambient H2O	0.416	40.2160	0.0000	
		111.5130	0.0000	

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	1616.9860	0.0000	
		1616.9860	0.0000	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:09:23  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan-Cal01.CHR (c:\peak359)  
 Sample: 1.10 ppm EtO std  
 Operator: D. Kremer



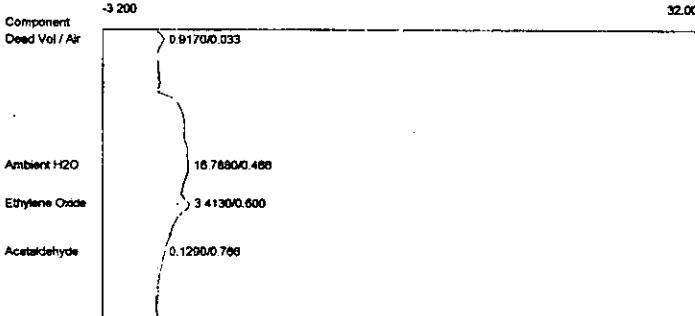
Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:09:23  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan-Cal01.CHR (c:\peak359)  
 Sample: 1.10 ppm EtO std  
 Operator: D. Kremer



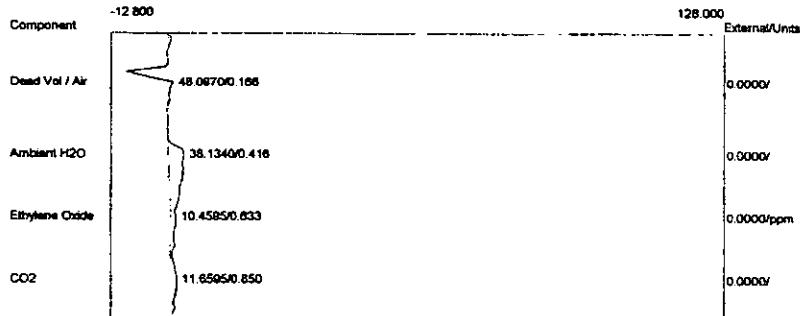
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	6.7050	0.0000	
Ethylene Oxide	0.633	3.6295	0.0000	ppm
Acetaldehyde	0.750	0.2620	0.0000	
		10.5965	0.0000	

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	87.2645	0.0000	
Ambient H2O	0.466	54.9010	0.0000	
Ethylene Oxide	0.700	10.8870	0.0000	ppm
CO2	0.900	5.0110	0.0000	
		158.0635	0.0000	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:12:10  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan-Cal02.CHR (c:\peak359)  
 Sample: 1.10 ppm EtO std  
 Operator: D. Kremer



Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:12:10  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan-Cal02.CHR (c:\peak359)  
 Sample: 1.10 ppm EtO std  
 Operator: D. Kremer

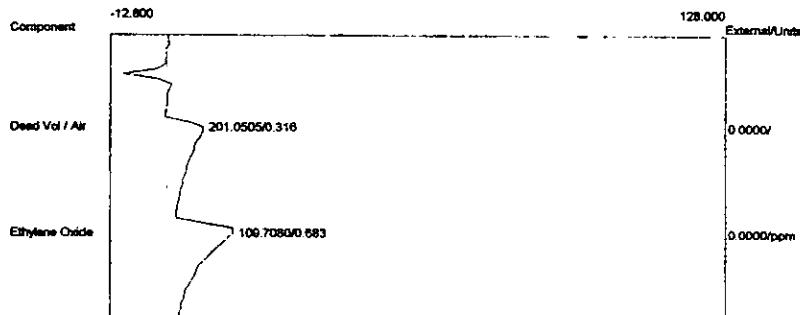
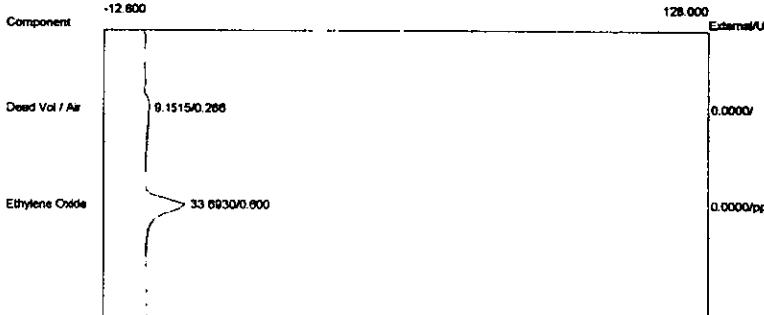


Component	Retention	Area	External	Units
Dead Vol / Air	0.033	0.9170	0.0000	
Ambient H2O	0.466	16.7880	0.0000	
Ethylene Oxide	0.600	3.4130	0.0000	ppm
Acetaldehyde	0.766	0.1290	0.0000	
	21.2470	0.0000		

Component	Retention	Area	External	Units
Dead Vol / Air	0.166	48.0870	0.0000	
Ambient H2O	0.416	38.1340	0.0000	
Ethylene Oxide	0.633	10.4595	0.0000	ppm
CO2	0.850	11.6595	0.0000	
	108.3400	0.0000		

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:15:57  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan-Cal03.CHR (c:\peak359)  
 Sample: 10.1 ppm EtO std  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:15:57  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan-Cal03.CHR (c:\peak359)  
 Sample: 10.1 ppm EtO std  
 Operator: D. Kremer

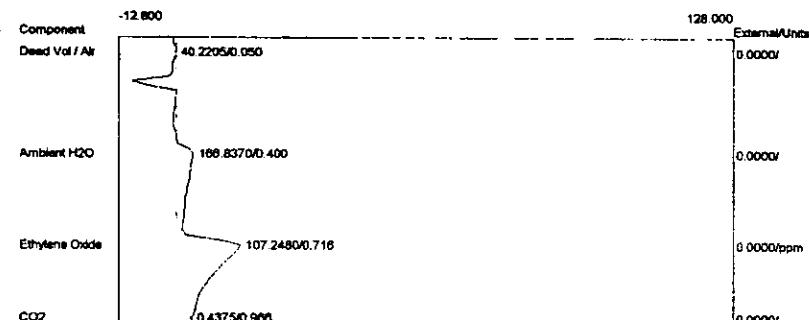
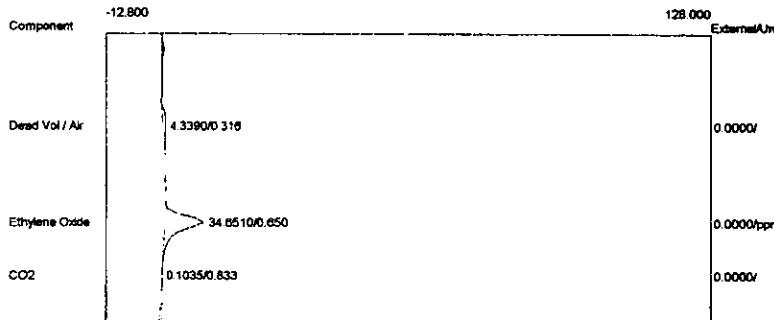


Component	Retention	Area	External	Units
Dead Vol / Air	0.266	9.1515	0.0000	
Ethylene Oxide	0.600	33.6930	0.0000	ppm
		42.8445	0.0000	

Component	Retention	Area	External	Units
Dead Vol / Air	0.316	201.0505	0.0000	
Ethylene Oxide	0.683	109.7080	0.0000	ppm
		310.7585	0.0000	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:19:22  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan-Cal04.CHR (c:\peak359)  
 Sample: 10.1 ppm EtO std  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:19:22  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan-Cal04.CHR (c:\peak359)  
 Sample: 10.1 ppm EtO std  
 Operator: D. Kremer

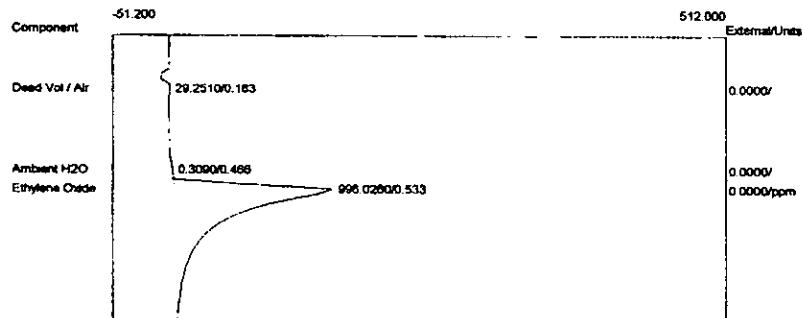
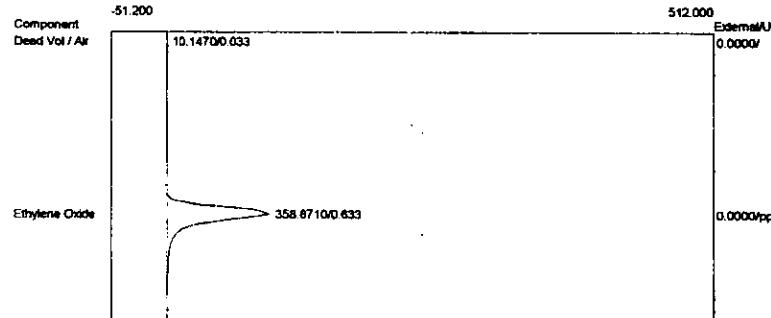


Component	Retention	Area	External	Units
Dead Vol / Air	0.316	4.3390	0.0000	
Ethylene Oxide	0.650	34.6510	0.0000 ppm	
CO2	0.833	0.1035	0.0000	
		39.0935	0.0000	

Component	Retention	Area	External	Units
Dead Vol / Air	0.050	40.2205	0.0000	
Ambient H2O	0.400	166.8370	0.0000	
Ethylene Oxide	0.716	107.2480	0.0000 ppm	
CO2	0.966	0.4375	0.0000	
		314.7430	0.0000	

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:39:31  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan-Cal05.CHR (c:\peak359)  
 Sample: 100 ppm EtO std  
 Operator: D. Kremer

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:39:31  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan-Cal05.CHR (c:\peak359)  
 Sample: 100 ppm EtO std  
 Operator: D. Kremer

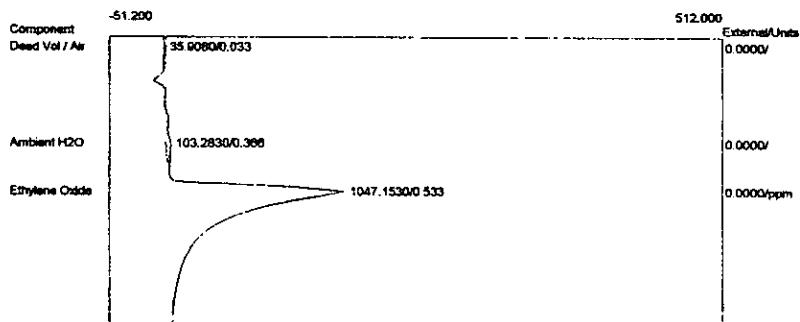
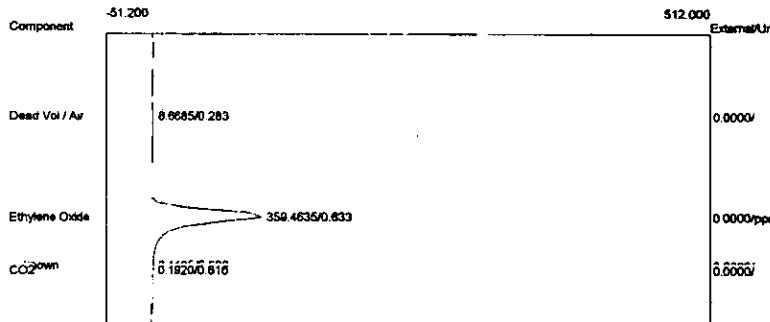


Component	Retention	Area	External	Units
Dead Vol / Air	0.033	10.1470	0.0000	
Ethylene Oxide	0.633	358.8710	0.0000	ppm
		369.0180	0.0000	

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	29.2510	0.0000	
Ambient H <sub>2</sub> O	0.466	0.3090	0.0000	
Ethylene Oxide	0.533	996.0260	0.0000	ppm
		1025.5860	0.0000	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:53:40  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan-Cal06.CHR (c:\peak359)  
 Sample: 100 ppm EtO std  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 10:53:40  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan-Cal06.CHR (c:\peak359)  
 Sample: 100 ppm EtO std  
 Operator: D. Kremer

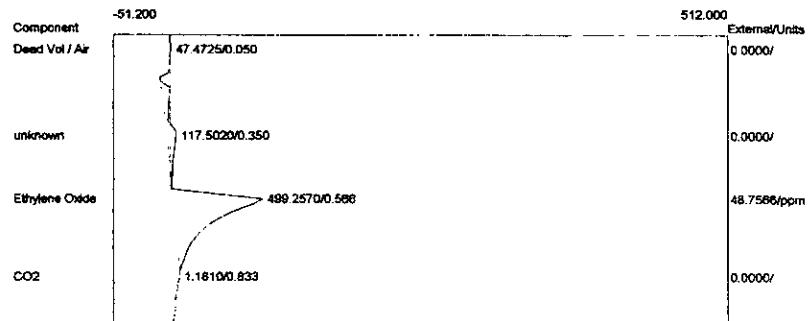
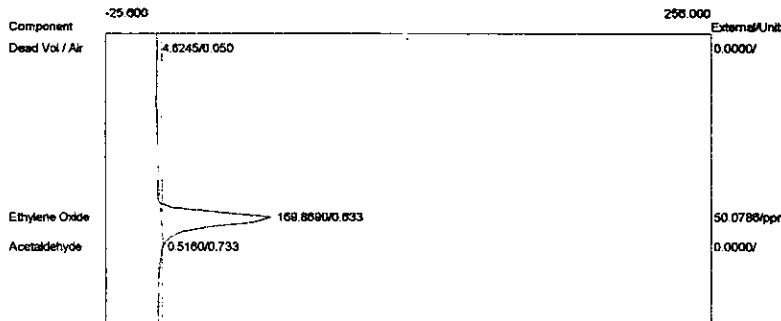


Component	Retention	Area	External	Units
Dead Vol / Air	0.283	8.6685	0.0000	
Ethylene Oxide	0.633	359.4635	0.0000	ppm
CO2	0.816	0.1920	0.0000	

Component	Retention	Area	External	Units
Dead Vol / Air	0.033	35.9080	0.0000	
Ambient H2O	0.366	103.2830	0.0000	
Ethylene Oxide	0.533	1047.1530	0.0000	ppm

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 11:07:18  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan-Audit.CHR (c:\peak359)  
 Sample: 48.8 ppm EtO audit std  
 Operator: D. Kremer

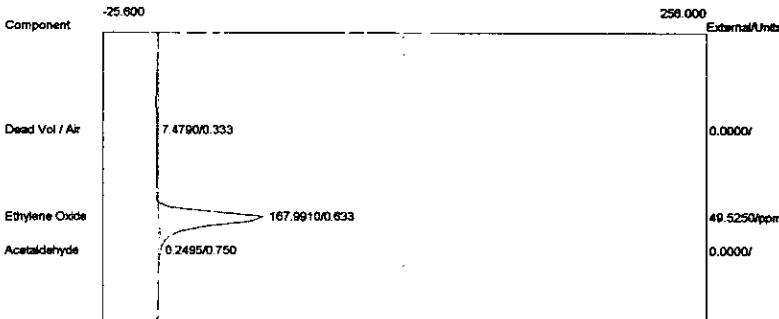
Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: PreCal  
 Analysis date: 05/16/2008 11:07:18  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan-Audit.CHR (c:\peak359)  
 Sample: 48.8 ppm EtO audit std  
 Operator: D. Kremer



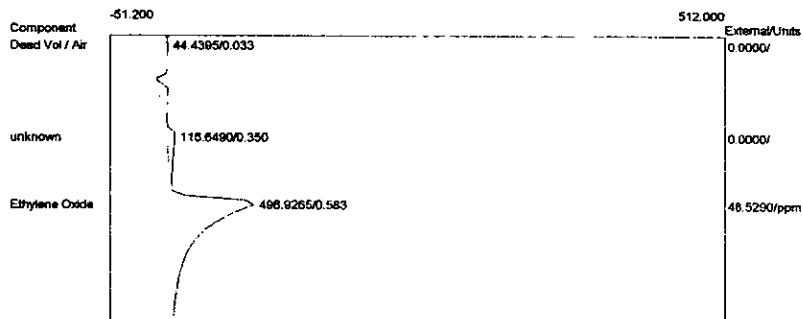
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	4.6245	0.0000	
Ethylene Oxide	0.633	169.8690	50.0786	ppm
Acetaldehyde	0.733	0.5160	0.0000	
	175.0095	50.0786		

Component	Retention	Area	External	Units
Dead Vol / Air	0.050	47.4725	0.0000	
Ethylene Oxide	0.566	499.2570	48.7566	ppm
CO2	0.833	1.1810	0.0000	
	547.9105	48.7566		

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: P~~IC~~Cal  
 Analysis date: 05/16/2008 14:31:00  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan-PAudit.CHR (c:\peak359)  
 Sample: 48.8 ppm EtO audit std  
 Operator: D. Kremer



Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: P~~IC~~Cal  
 Analysis date: 05/16/2008 14:31:00  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan-PAudit.CHR (c:\peak359)  
 Sample: 48.8 ppm EtO audit std  
 Operator: D. Kremer



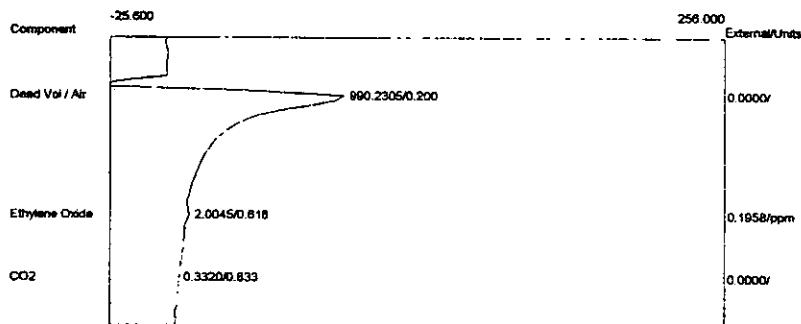
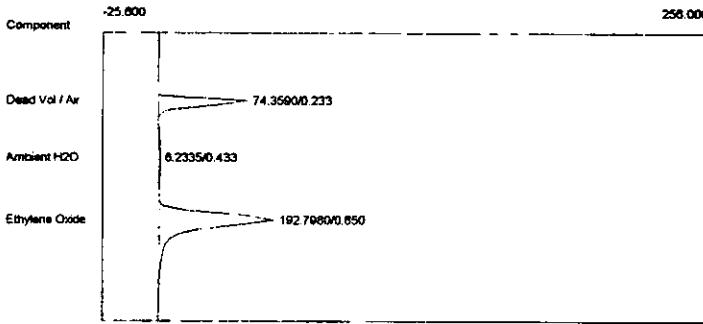
Component	Retention	Area	External	Units
Dead Vol / Air	0.333	7.4790	0.0000	
Ethylene Oxide	0.633	167.9910	49.5250	ppm
Acetaldehyde	0.750	0.2495	0.0000	

Component	Retention	Area	External	Units
Dead Vol / Air	0.033	44.4395	0.0000	
Ethylene Oxide	0.583	115.6490	48.5290	ppm
Ethylene Oxide	0.583	496.9265	0.583	

**APPENDIX B**  
**Run #1 Chromatograms**

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:21:09  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, Carbopack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer01.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

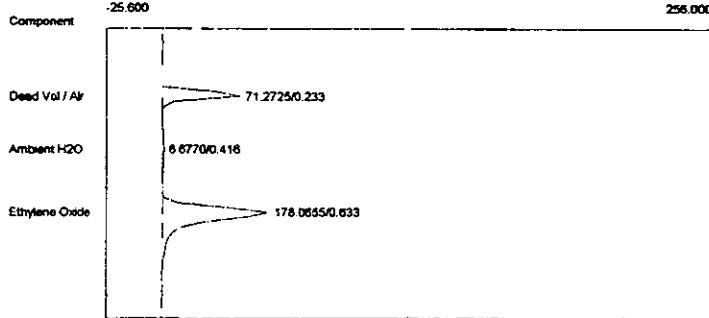
Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:21:09  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, Carbopack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer01.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



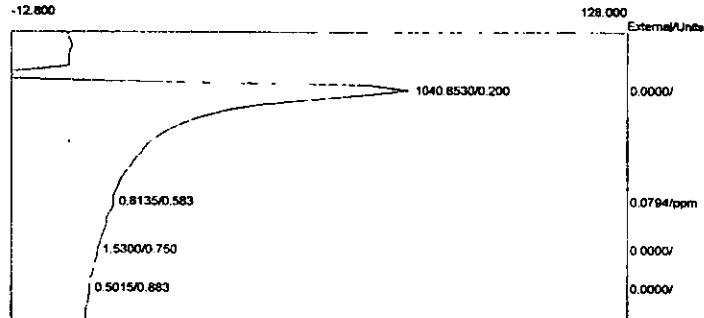
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	74.3590	0.0000	
Ambient H2O	0.433	6.2335	0.0000	
Ethylene Oxide	0.650	192.7980	56.8383 ppm	
	273.3905	56.8383		

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	990.2305	0.0000	
Ethylene Oxide	0.616	2.0045	0.1958 ppm	
CO2	0.833	0.3320	0.0000	
	992.5670	0.1958		

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:26:20  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer02.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:26:20  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer02.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

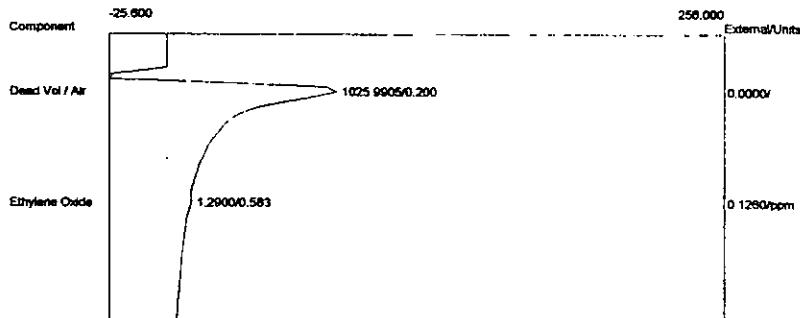
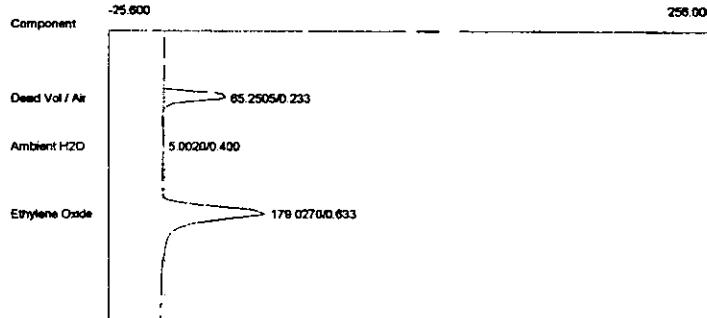


Component	Retention	Area	External	Units
Dead Vol / Air	0.233	71.2725	0.0000	
Ambient H2O	0.416	6.6770	0.0000	
Ethylene Oxide	0.633	178.0655	52.4950 ppm	
	256.0150	52.4950		

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	1040.8530	0.0000	
Ethylene Oxide	0.583	0.8135	0.0794	ppm
Acetaldehyde	0.750	1.5300	0.0000	
CO2	0.883	0.5015	0.0000	
	1043.6980	0.0794		

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:32:08  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer03.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:32:08  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer03.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

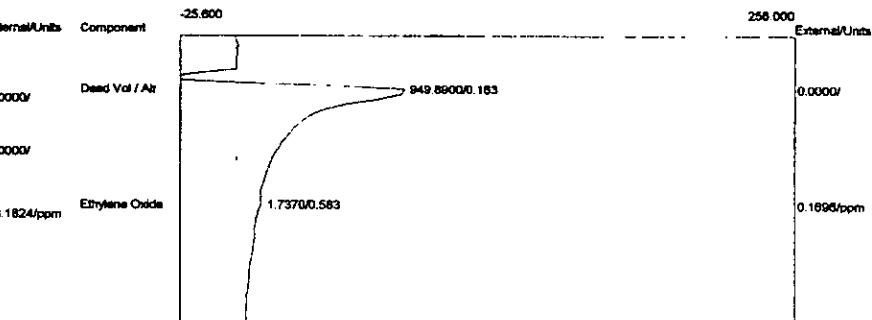
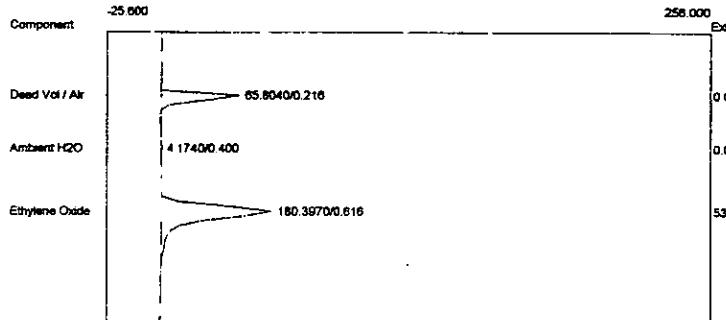


Component	Retention	Area	External	Units
Dead Vol / Air	0.233	65.2505	0.0000	
Ambient H2O	0.400	5.0020	0.0000	
Ethylene Oxide	0.633	179.0270	52.7785 ppm	
		249.2795	52.7785	

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	1025.9905	0.0000	
Ethylene Oxide	0.583	1.2900	0.1260	ppm
		1027.2805	0.1260	

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:37:56  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer04.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:37:56  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer04.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

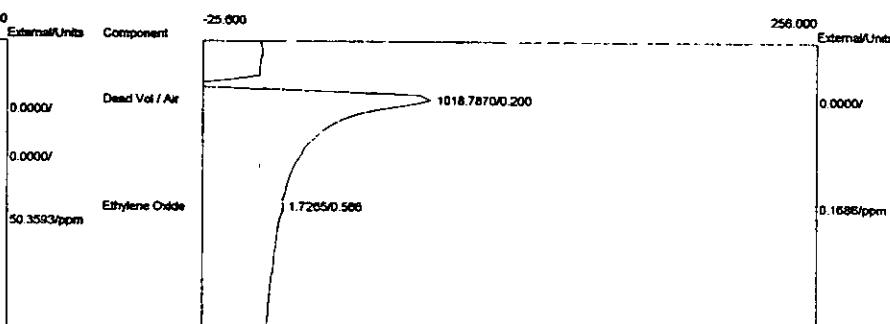
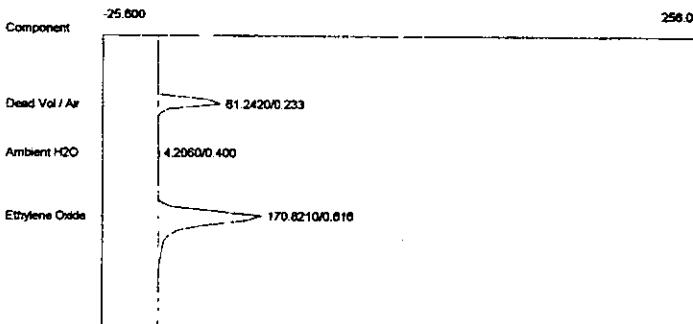


Component	Retention	Area	External	Units
Dead Vol / Air	0.216	65.8040	0.0000	
Ambient H2O	0.400	4.1740	0.0000	
Ethylene Oxide	0.616	180.3970	53.1824 ppm	
	250.3750	53.1824		

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	949.8900	0.0000	
Ethylene Oxide	0.583	1.7370	0.1696 ppm	
	951.6270	0.1696		

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:41:16  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer05.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:41:16  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer05.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

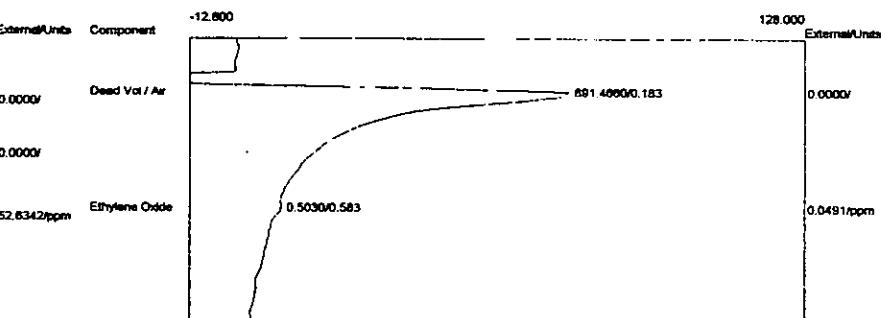
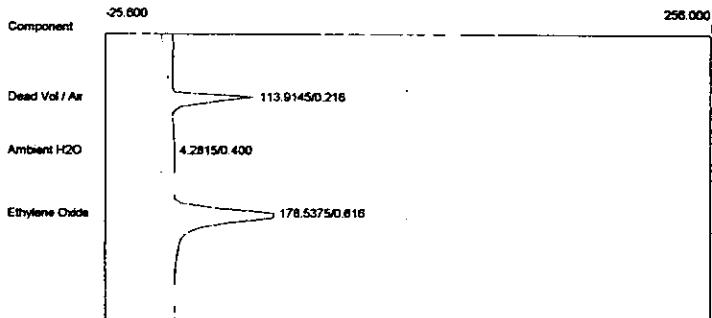


Component	Retention	Area	External	Units
Dead Vol / Air	0.233	61.2420	0.0000	
Ambient H2O	0.400	4.2060	0.0000	
Ethylene Oxide	0.616	170.8210	50.3593 ppm	
		236.2690	50.3593	

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	1018.7870	0.0000	
Ethylene Oxide	0.566	1.7265	0.1686 ppm	
		1020.5135	0.1686	

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:47:13  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer06.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

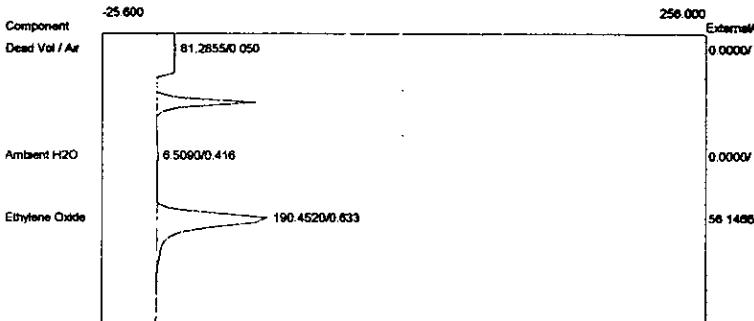
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 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:47:13  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer06.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



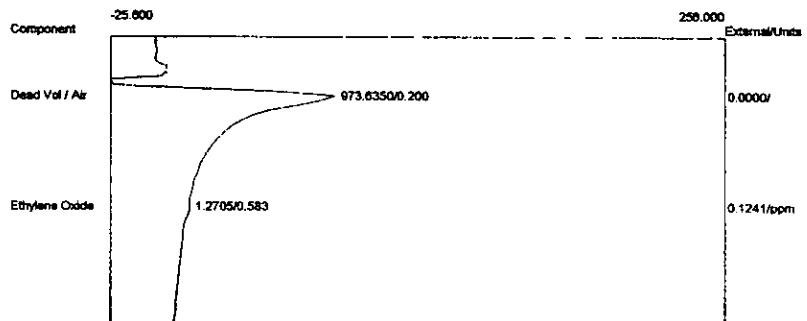
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	113.9145	0.0000	
Ambient H2O	0.400	4.2815	0.0000	
Ethylene Oxide	0.616	178.5375	52.6342 ppm	
	296.7335	52.6342		

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	891.4660	0.0000	
Ethylene Oxide	0.583	0.5030	0.0491 ppm	
	891.9690	0.0491		

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:53:14  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer07.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:53:14  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer07.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

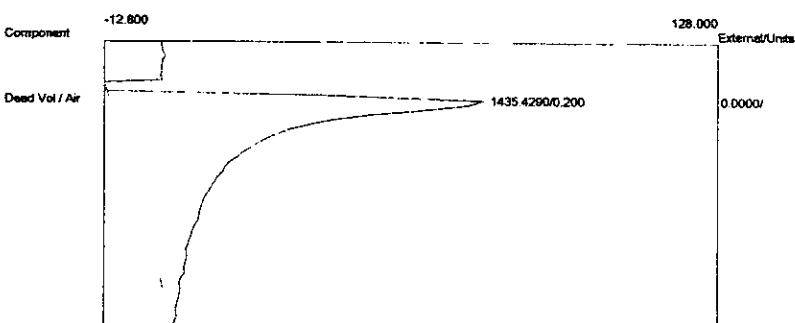
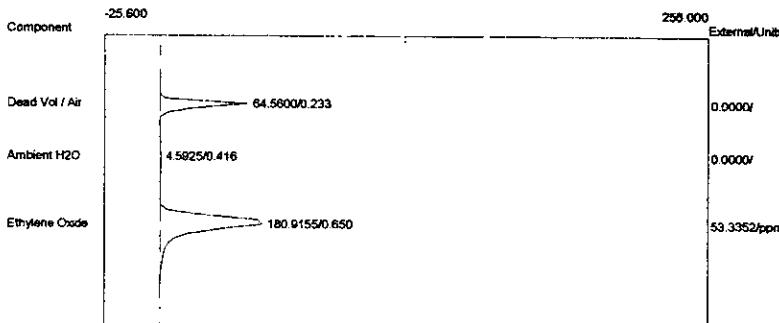


Component	Retention	Area	External	Units
Dead Vol / Air	0.050	81.2855	0.0000	
Ambient H2O	0.416	6.5090	0.0000	
Ethylene Oxide	0.633	190.4520	56.1466 ppm	
		278.2465	56.1466	

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	973.6350	0.0000	
Ethylene Oxide	0.583	1.2705	0.1241 ppm	
		974.9055	0.1241	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:56:19  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer08.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 11:56:19  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer08.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

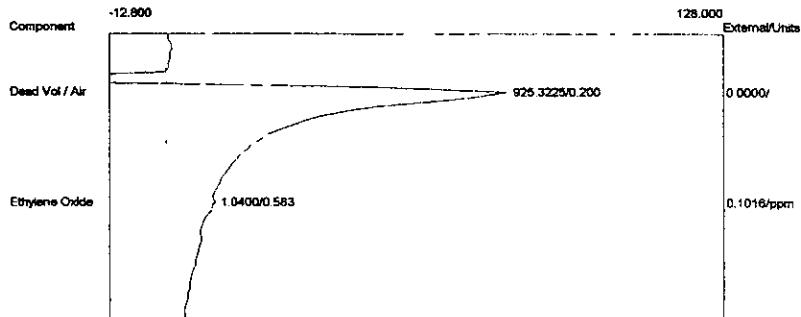
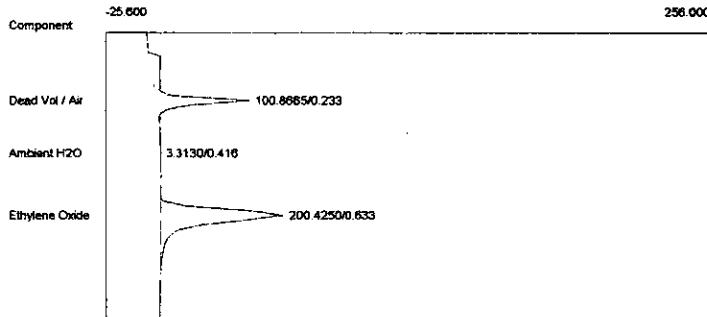


Component	Retention	Area	External	Units
Dead Vol / Air	0.233	64.5600	0.0000	
Ambient H <sub>2</sub> O	0.416	4.5925	0.0000	
Ethylene Oxide	0.650	180.9155	53.3352 ppm	
		250.0680	53.3352	

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	1435.4290	0.0000	
		1435.4290	0.0000	

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 12:01:37  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer09.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

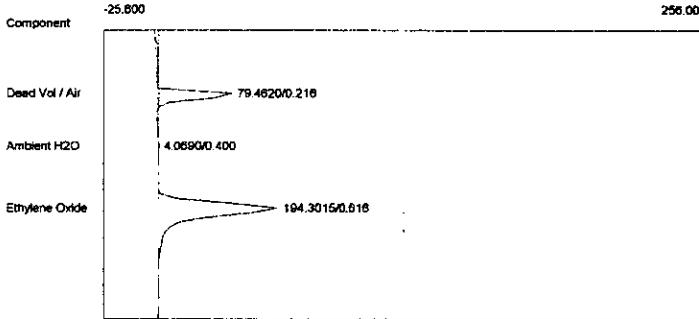
Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 12:01:37  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer09.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



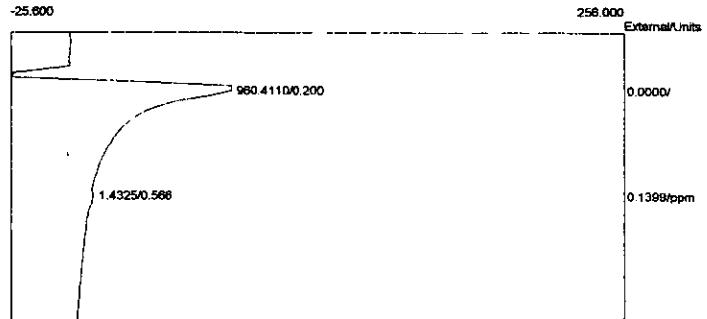
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	100.8665	0.0000	
Ambient H2O	0.416	3.3130	0.0000	
Ethylene Oxide	0.633	200.4250	59.0868 ppm	
		304.6045	59.0868	

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	925.3225	0.0000	
Ethylene Oxide	0.583	1.0400	0.1016 ppm	
		926.3625	0.1016	

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 12:07:30  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer10.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



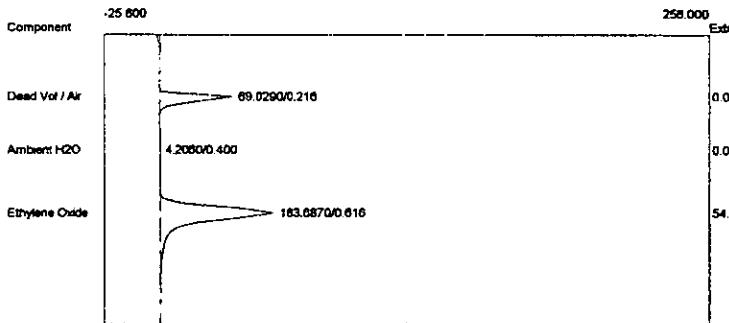
Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 12:07:30  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer10.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



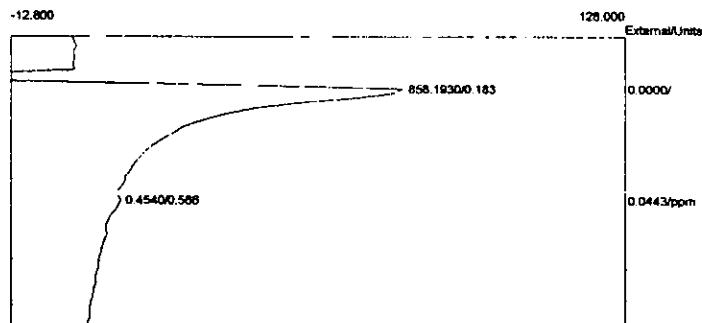
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	79.4620	0.0000	
Ambient H2O	0.400	4.0690	0.0000	
Ethylene Oxide	0.616	194.3015	57.2815 ppm	
	277.8325	57.2815		

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	960.4110	0.0000	
Ethylene Oxide	0.566	1.4325	0.1399 ppm	
	961.8435	0.1399		

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 12:12:08  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer11.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 12:12:08  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer11.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

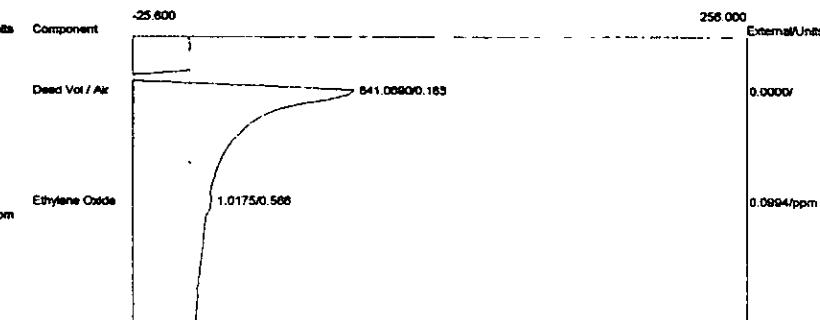
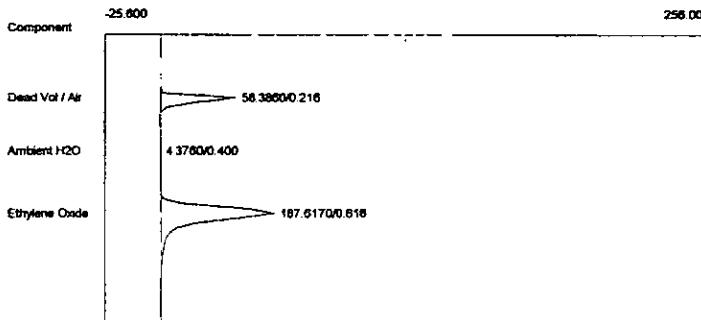


Component	Retention	Area	External	Units
Dead Vol / Air	0.216	69.0290	0.0000	
Ambient H2O	0.400	4.2060	0.0000	
Ethylene Oxide	0.616	183.6870	54.1523 ppm	
		256.9220	54.1523	

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	858.1930	0.0000	
Ethylene Oxide	0.566	0.4540	0.0443 ppm	
		858.6470	0.0443	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 12:16:21  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan1-Aer12.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#1Aer  
 Analysis date: 05/16/2008 12:16:21  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan1-Aer12.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

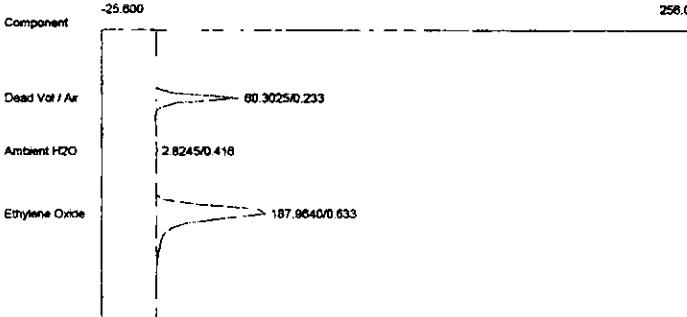


Component	Retention	Area	External	Units
Dead Vol / Air	0.216	58.3860	0.0000	
Ambient H2O	0.400	4.3760	0.0000	
Ethylene Oxide	0.616	187.6170	55.3109 ppm	
	250.3790	55.3109		

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	841.0690	0.0000	
Ethylene Oxide	0.566	1.0175	0.0994 ppm	
	842.0865	0.0994		

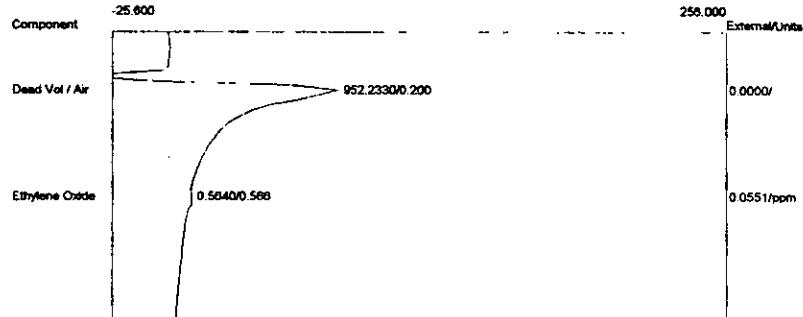
**APPENDIX C**  
**Run #2 Chromatograms**

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:21:03  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan2-Aer01.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	60.3025	0.0000	
Ambient H2O	0.416	2.8245	0.0000	
Ethylene Oxide	0.633	187.9640	55.4132 ppm	
		251.0910	55.4132	

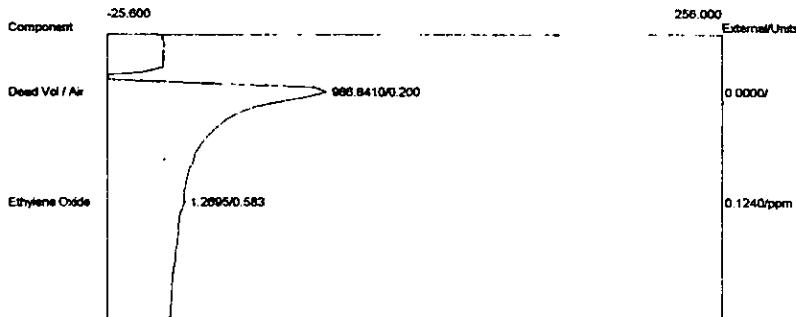
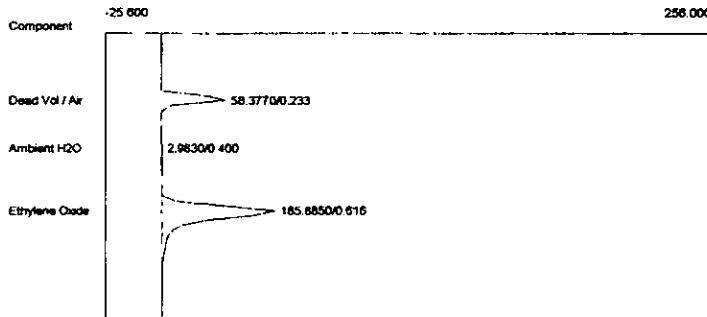
Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:21:03  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan2-Aer01.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.200	952.2330	0.0000	
Ethylene Oxide	0.566	0.5640	0.0551 ppm	
		952.7970	0.0551	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:26:03  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan2-Aer02.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

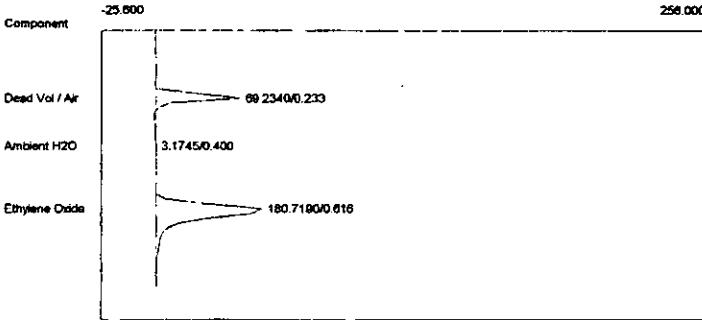
Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:26:03  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan2-Aer02.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	58.3770	0.0000	
Ambient H2O	0.400	2.9830	0.0000	
Ethylene Oxide	0.616	185.8850	54.8003 ppm	
	247.2450	54.8003		

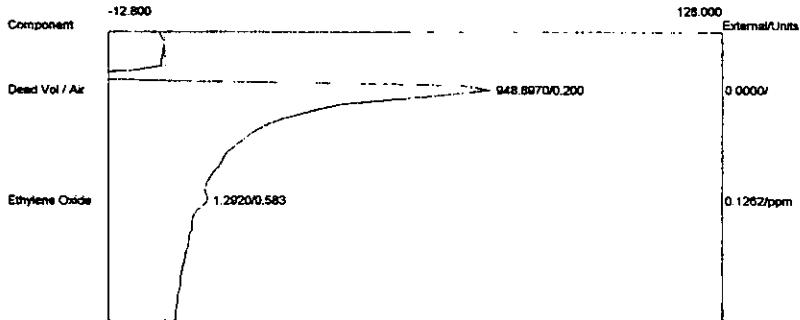
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	986.8410	0.0000	
Ethylene Oxide	0.583	1.2695	0.1240 ppm	
	988.1105	0.1240		

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:31:43  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan2-Aer03.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	69.2340	0.0000	
Ambient H2O	0.400	3.1745	0.0000	
Ethylene Oxide	0.616	180.7190	53.2773 ppm	
		253.1275	53.2773	

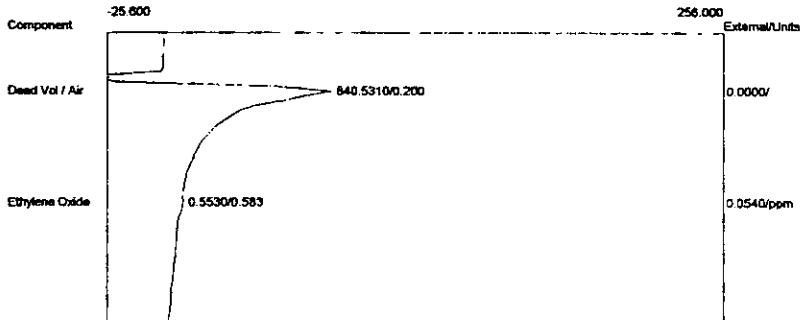
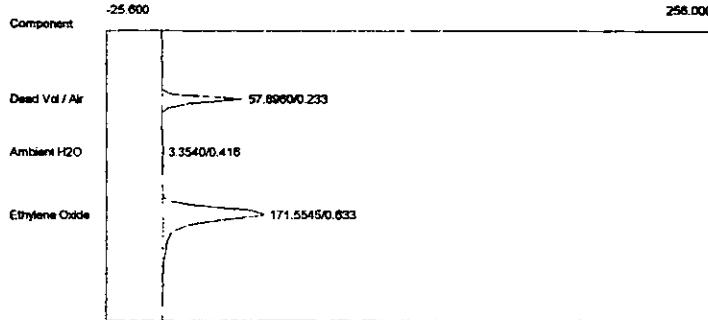
Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:31:43  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan2-Aer03.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.200	948.8970	0.0000	
Ethylene Oxide	0.583	1.2920	0.1262 ppm	
		950.1890	0.1262	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:36:14  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan2-Aer04.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

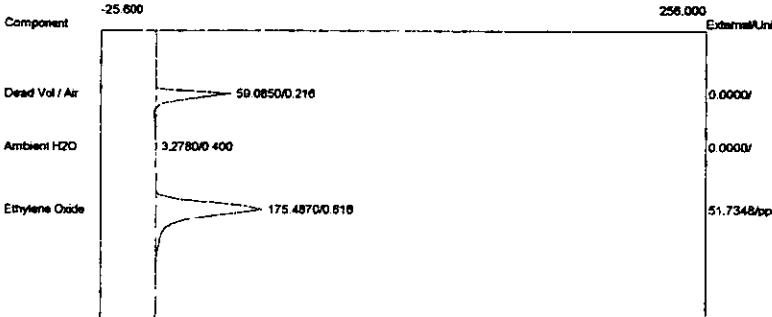
Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:36:14  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan2-Aer04.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	57.8960	0.0000	
Ambient H2O	0.416	3.3540	0.0000	
Ethylene Oxide	0.633	171.5545	50.5755 ppm	
	232.8045	50.5755		

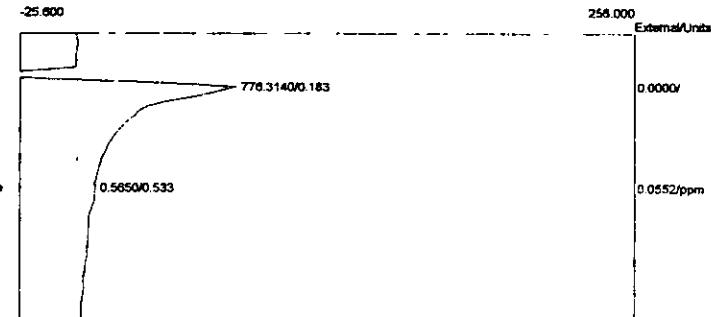
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	840.5310	0.0000	
Ethylene Oxide	0.583	0.5530	0.0540	ppm
	841.0840	0.0540		

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:41:56  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan2-Aer05.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



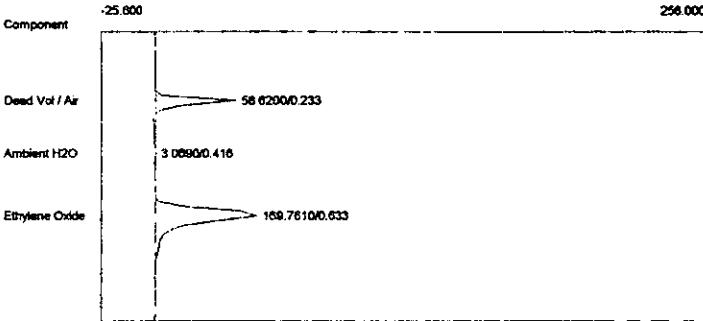
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	59.0850	0.0000	
Ambient H2O	0.400	3.2780	0.0000	
Ethylene Oxide	0.616	175.4870	51.7348 ppm	
		237.8500	51.7348	

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:41:56  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan2-Aer05.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

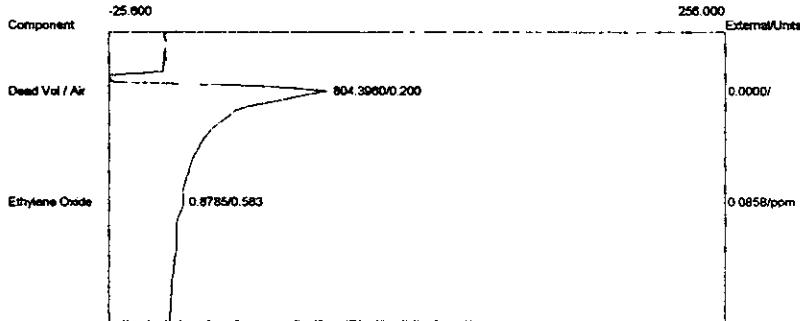


Component	Retention	Area	External	Units
Dead Vol / Air	0.183	776.3140	0.0000	
Ethylene Oxide	0.533	0.5650	0.0552 ppm	
		776.8790	0.0552	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:46:53  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan2-Aer06.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



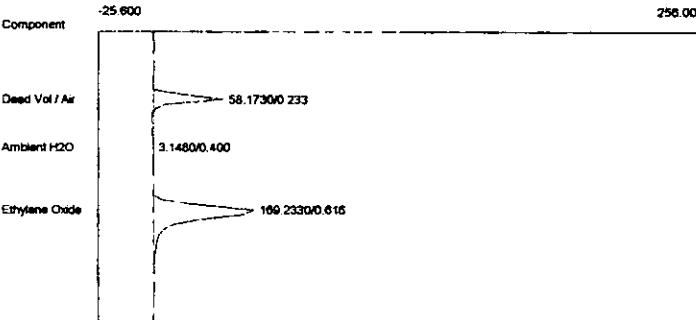
Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:46:53  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan2-Aer06.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



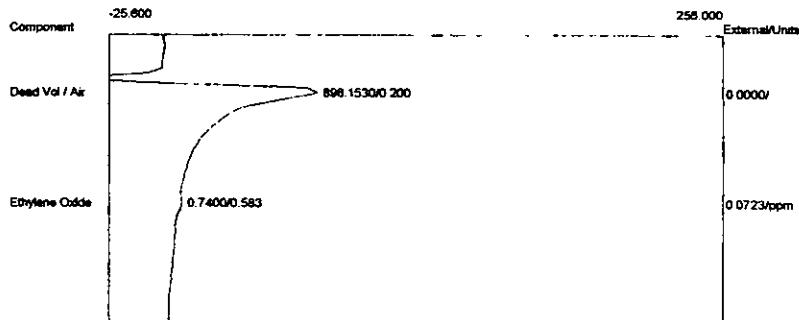
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	58.6200	0.0000	
Ambient H2O	0.416	3.0690	0.0000	
Ethylene Oxide	0.633	169.7610	50.0468 ppm	
	231.4500	50.0468		

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	804.3960	0.0000	
Ethylene Oxide	0.583	0.8785	0.0858	ppm
	805.2745	0.0858		

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:51:20  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan2-Aer07.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



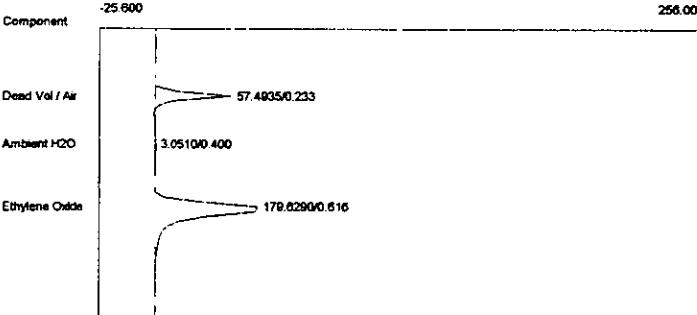
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 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:51:20  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan2-Aer07.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	58.1730	0.0000	
Ambient H2O	0.400	3.1480	0.0000	
Ethylene Oxide	0.616	169.2330	49.8911 ppm	
	230.5540	49.8911		

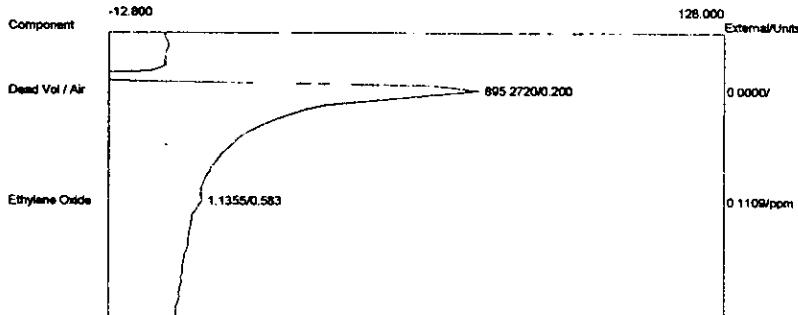
Component	Retention	Area	External	Units
Dead Vol / Air	0.200	898.1530	0.0000	
Ethylene Oxide	0.583	0.7400	0.0723 ppm	
	898.8930	0.0723		

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:56:01  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, Carbopack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan2-Aer08.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	57.4935	0.0000	
Ambient H2O	0.400	3.0510	0.0000	
Ethylene Oxide	0.616	179.6290	52.9559 ppm	
		240.1735	52.9559	

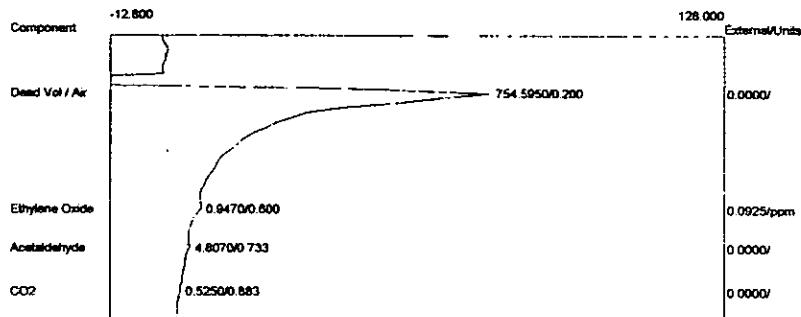
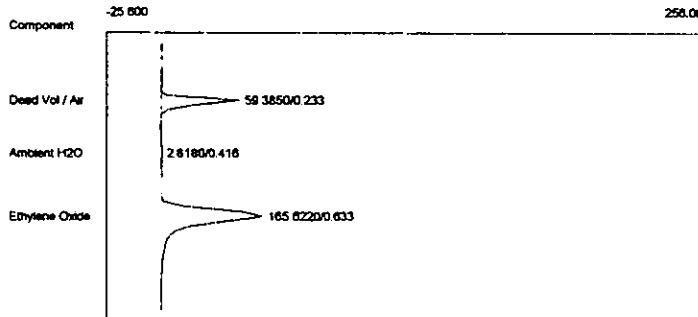
Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 12:56:01  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, Carbopack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan2-Aer08.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.200	895.2720	0.0000	
Ethylene Oxide	0.583	1.1355	0.1109 ppm	
		896.4075	0.1109	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 13:01:05  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, Carbopack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan2-Aer09.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 13:01:05  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, Carbopack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan2-Aer09.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

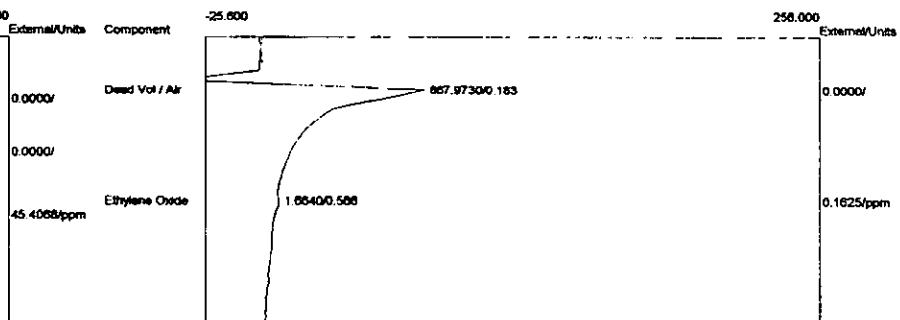
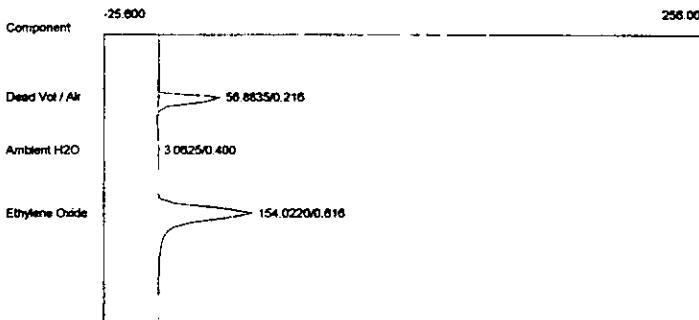


Component	Retention	Area	External	Units
Dead Vol / Air	0.233	59.3850	0.0000	
Ambient H2O	0.416	2.8180	0.0000	
Ethylene Oxide	0.633	165.6220	48.8266 ppm	
	227.8250	48.8266		

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	754.5950	0.0000	
Ethylene Oxide	0.600	0.9470	0.0925 ppm	
Acetaldehyde	0.733	4.8070	0.0000	
CO2	0.883	0.5250	0.0000	
	760.8740	0.0925		

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 13:06:02  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan2-Aer10.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 13:06:02  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan2-Aer10.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

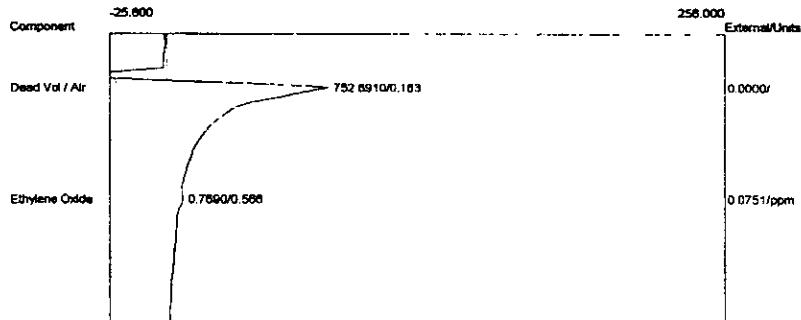
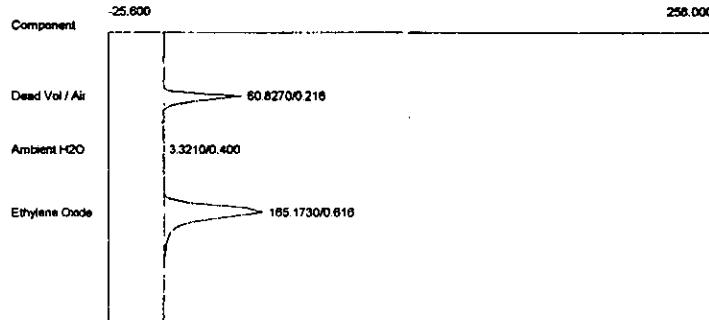


Component	Retention	Area	External	Units
Dead Vol / Air	0.216	56.8835	0.0000	
Ambient H2O	0.400	3.0625	0.0000	
Ethylene Oxide	0.616	154.0220	45.4068	ppm
	213.9680		45.4068	

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	867.9730	0.0000	
Ethylene Oxide	0.566	1.6640	0.1625	ppm
	869.6370		0.1625	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 13:11:11  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan2-Aer11.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#2Aer  
 Analysis date: 05/16/2008 13:11:11  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan2-Aer11.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



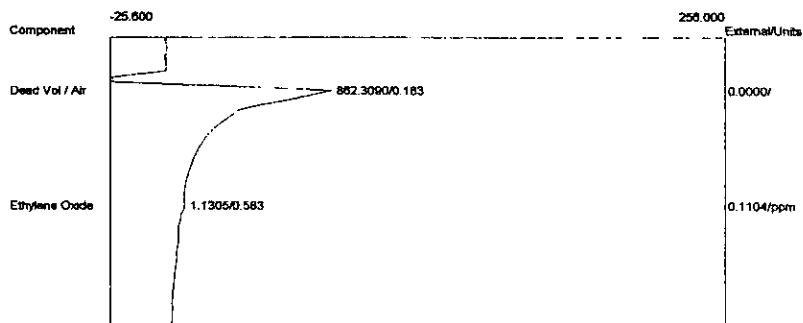
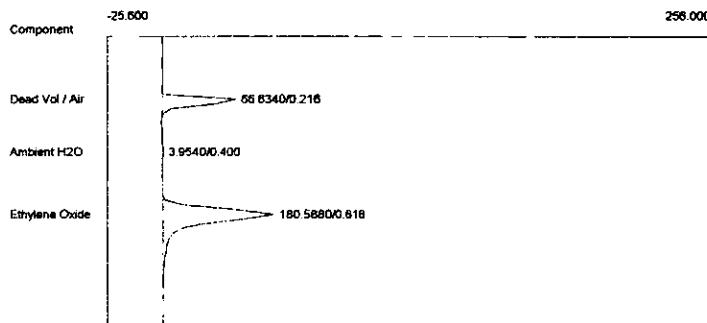
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	60.8270	0.0000	
Ambient H2O	0.400	3.3210	0.0000	
Ethylene Oxide	0.616	165.1730	48.6942 ppm	
	229.3210	48.6942		

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	752.8910	0.0000	
Ethylene Oxide	0.566	0.7690	0.0751 ppm	
	753.6600	0.0751		

**APPENDIX D**  
**Run #3 Chromatograms**

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:21:02  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, Carbo pack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer01.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

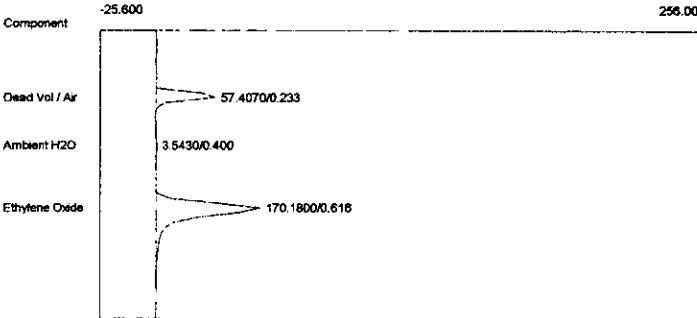
Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:21:02  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, Carbo pack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer01.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



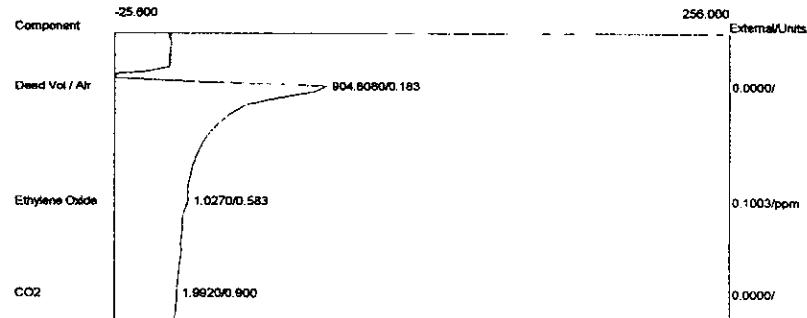
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	66.6340	0.0000	
Ambient H <sub>2</sub> O	0.400	3.9540	0.0000	
Ethylene Oxide	0.616	180.5880	53.2387 ppm	
	251.1760	53.2387		

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	862.3090	0.0000	
Ethylene Oxide	0.583	1.1305	0.1104 ppm	
	863.4395	0.1104		

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:26:01  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer02.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:26:01  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer02.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

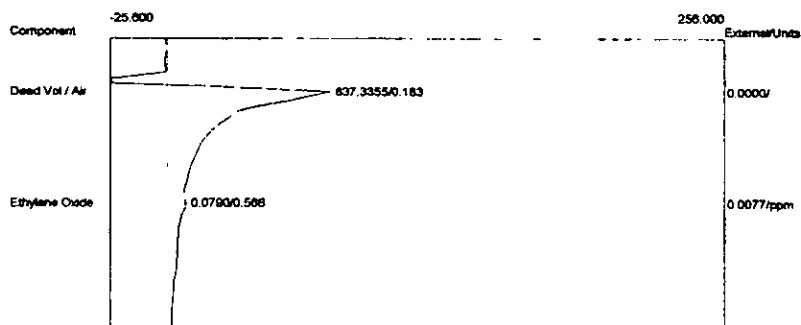
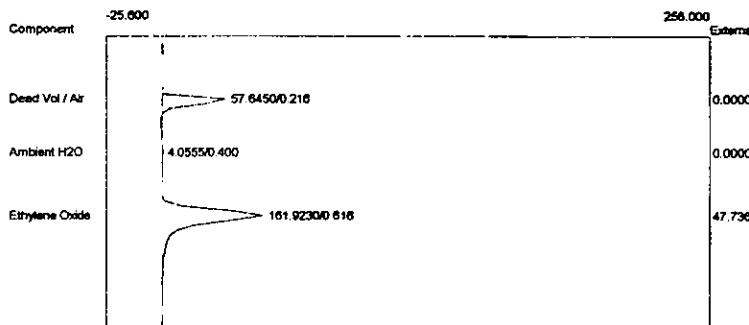


Component	Retention	Area	External	Units
Dead Vol / Air	0.233	57.4070	0.0000	
Ambient H2O	0.400	3.5430	0.0000	
Ethylene Oxide	0.616	170.1800	50.1703 ppm	
		231.1300	50.1703	

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	904.8080	0.0000	
Ethylene Oxide	0.583	1.0270	0.1003 ppm	
CO2	0.900	1.9920	0.0000	
		907.8270	0.1003	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:31:19  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer03.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:31:19  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer03.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

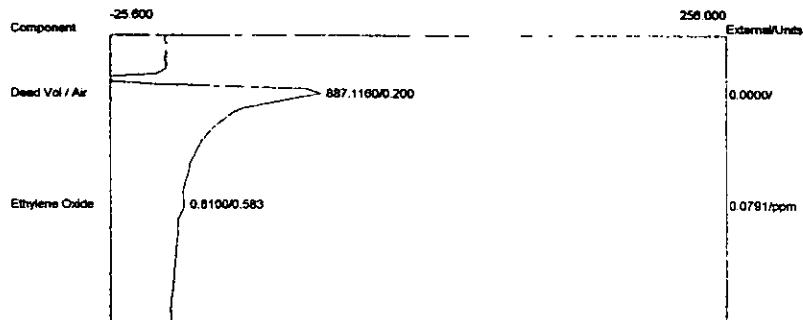
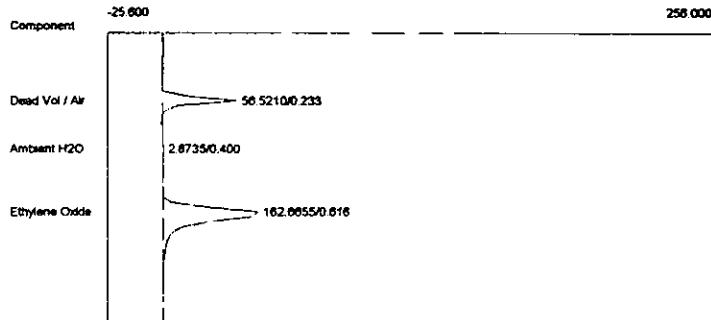


Component	Retention	Area	External	Units
Dead Vol / Air	0.216	57.6450	0.0000	
Ambient H2O	0.400	4.0555	0.0000	
Ethylene Oxide	0.616	161.9230	47.7361	ppm
		223.6235	47.7361	

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	837.3355	0.0000	
Ethylene Oxide	0.566	0.0790	0.0077	ppm
		837.4145	0.0077	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:36:02  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, Carbo pack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer04.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:36:02  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, Carbo pack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer04.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

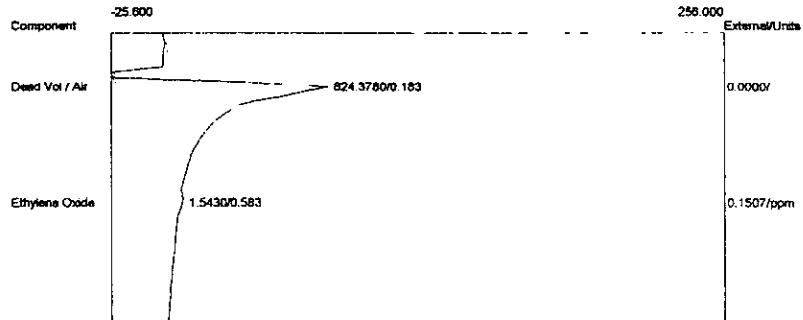
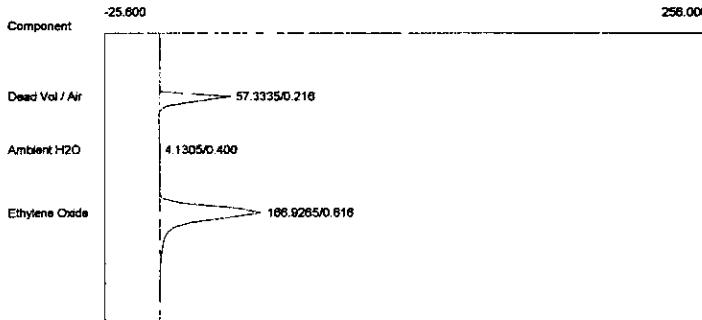


Component	Retention	Area	External	Units
Dead Vol / Air	0.233	56.5210	0.0000	
Ambient H2O	0.400	2.8735	0.0000	
Ethylene Oxide	0.616	162.6655	47.9550 ppm	
		222.0600	47.9550	

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	887.1160	0.0000	
Ethylene Oxide	0.583	0.8100	0.0791	ppm
		887.9260	0.0791	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:41:01  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, Carboback B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer05.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

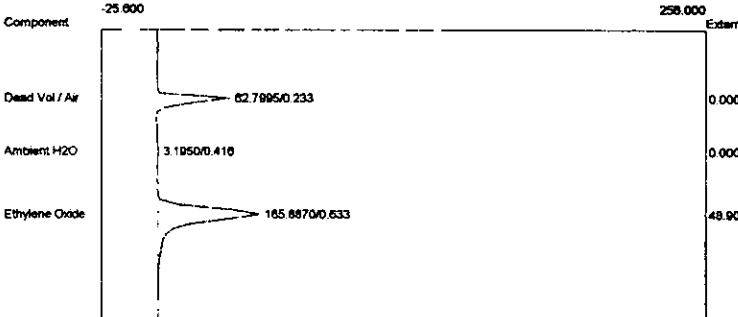
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 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:41:01  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, Carboback B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer05.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	57.3335	0.0000	
Ambient H <sub>2</sub> O	0.400	4.1305	0.0000	
Ethylene Oxide	0.616	166.9265	49.2112 ppm	
		228.3905	49.2112	

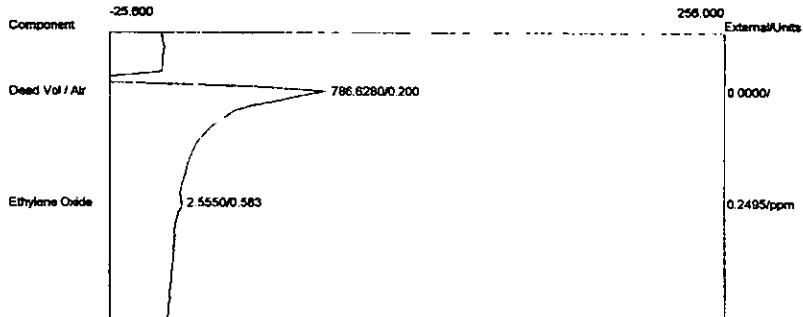
Component	Retention	Area	External	Units
Dead Vol / Air	0.183	824.3780	0.0000	
Ethylene Oxide	0.583	1.5430	0.1507 ppm	
		825.9210	0.1507	

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:46:48  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer06.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	62.7995	0.0000	
Ambient H2O	0.416	3.1950	0.0000	
Ethylene Oxide	0.633	165.8870	48.9047 ppm	
		231.8815	48.9047	

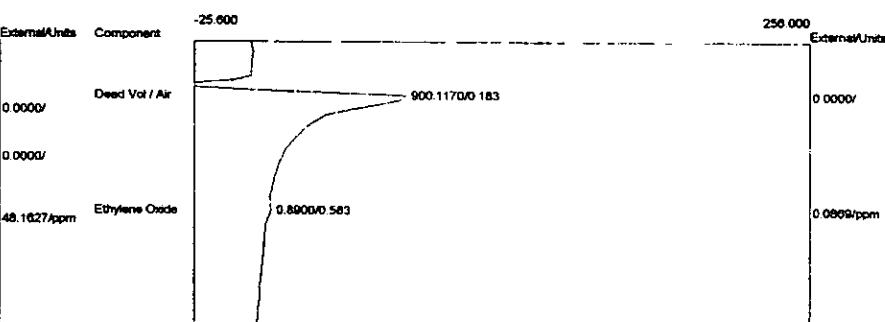
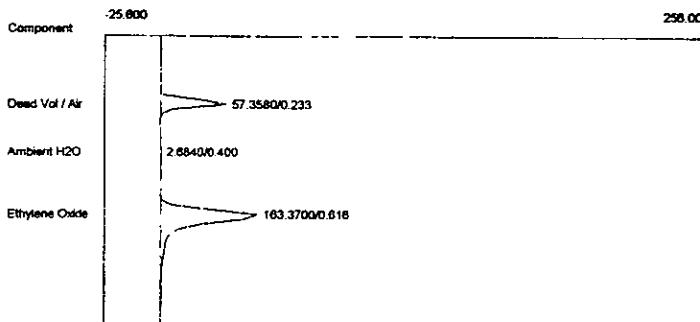
Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:46:48  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer06.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.200	786.6280	0.0000	
Ethylene Oxide	0.583	2.5550	0.2495 ppm	
		789.1830	0.2495	

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:51:21  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer07.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

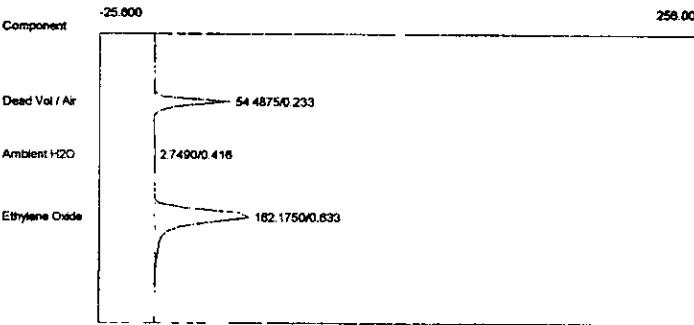
Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:51:21  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer07.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



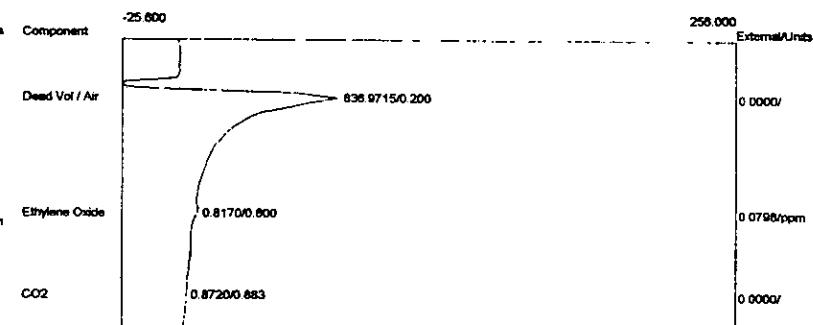
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	57.3580	0.0000	
Ambient H2O	0.400	2.6840	0.0000	
Ethylene Oxide	0.616	163.3700	48.1627 ppm	
	223.4120	48.1627		

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	900.1170	0.0000	
Ethylene Oxide	0.583	0.8900	0.0869 ppm	
	901.0070	0.0869		

Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:56:01  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer08.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer



Lab name: ECSI  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 13:56:01  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer08.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

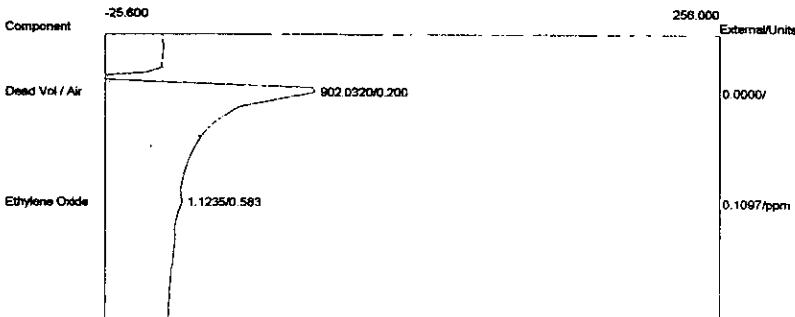
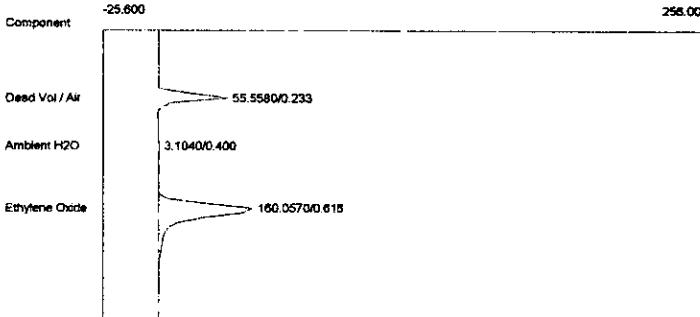


Component	Retention	Area	External	Units
Dead Vol / Air	0.233	54.4875	0.0000	
Ambient H2O	0.416	2.7490	0.0000	
Ethylene Oxide	0.633	162.1750	47.8104	ppm
	219.4115	47.8104		

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	836.9715	0.0000	
Ethylene Oxide	0.600	0.8170	0.0798	ppm
CO2	0.883	0.8720	0.0000	
	838.6605	0.0798		

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 14:01:20  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer09.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 14:01:20  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer09.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

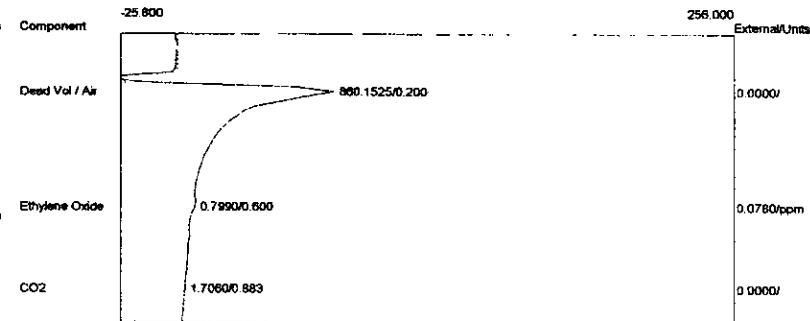
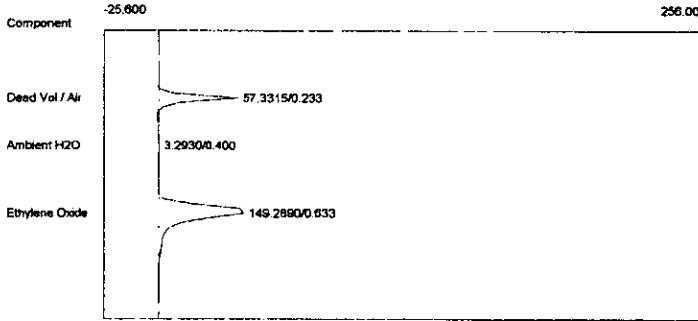


Component	Retention	Area	External	Units
Dead Vol / Air	0.233	55.5580	0.0000	
Ambient H2O	0.400	3.1040	0.0000	
Ethylene Oxide	0.616	160.0570	47.1860	ppm
	218.7190	47.1860		

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	902.0320	0.0000	
Ethylene Oxide	0.583	1.1235	0.1097	ppm
	903.1555	0.1097		

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 14:07:02  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer10.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 14:07:02  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer10.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer

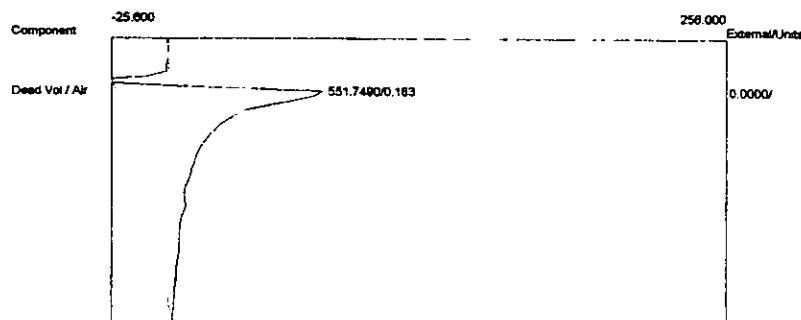
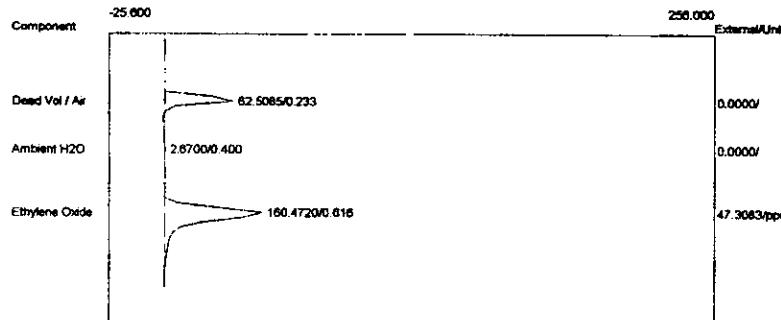


Component	Retention	Area	External	Units
Dead Vol / Air	0.233	57.3315	0.0000	
Ambient H2O	0.400	3.2930	0.0000	
Ethylene Oxide	0.633	149.2890	44.0115 ppm	
	209.9135	44.0115		

Component	Retention	Area	External	Units
Dead Vol / Air	0.200	860.1525	0.0000	
Ethylene Oxide	0.600	0.7990	0.0780 ppm	
CO2	0.883	1.7060	0.0000	
	862.6575	0.0780		

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 14:11:55  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, Carbopack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer11.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

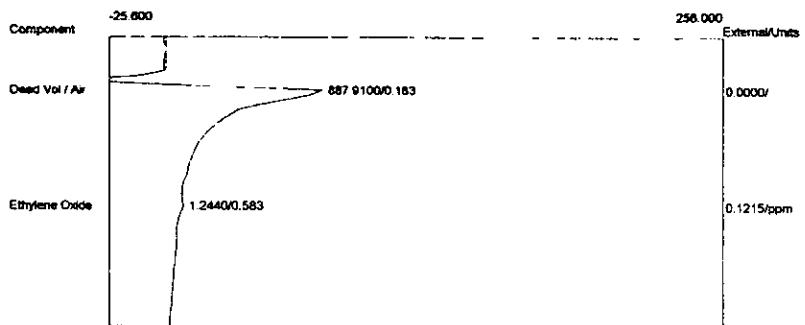
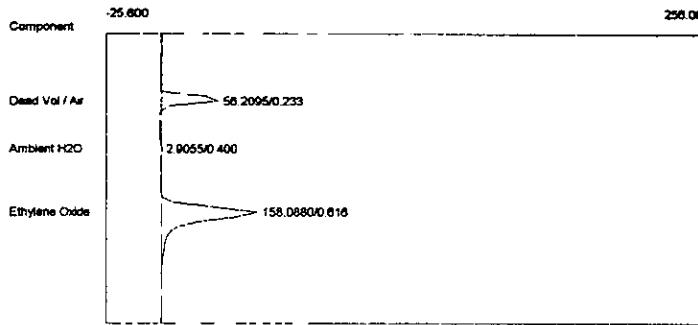
Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 14:11:55  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, Carbopack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer11.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	62.5085	0.0000	
Ambient H2O	0.400	2.6700	0.0000	
Ethylene Oxide	0.616	160.4720	47.3083 ppm	
	225.6505	47.3083		

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 14:17:10  
 Method: Direct Injection  
 Description: CHANNEL 1 - FID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO1-100.CPT  
 Data file: 1SterisWaukegan3-Aer12.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Inlet  
 Operator: D. Kremer

Lab name: ECSi  
 Client: Steris Isomedix - Waukegan  
 Client ID: Run#3Aer  
 Analysis date: 05/16/2008 14:17:10  
 Method: Direct Injection  
 Description: CHANNEL 2 - PID  
 Column: 1% SP-1000, CarboPack B  
 Carrier: HELIUM  
 Temp. prog: eto-100.tem  
 Components: ETO2-100.CPT  
 Data file: 2SterisWaukegan3-Aer12.CHR (c:\peak359)  
 Sample: Catalytic Oxidizer Outlet  
 Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	56.2095	0.0000	
Ambient H2O	0.400	2.9055	0.0000	
Ethylene Oxide	0.616	158.0880	46.6055 ppm	
	217.2030	46.6055		

Component	Retention	Area	External	Units
Dead Vol / Air	0.183	887.9100	0.0000	
Ethylene Oxide	0.583	1.2440	0.1215 ppm	
	889.1540	0.1215		

**APPENDIX E**  
**Field Data and Calculation Worksheets**

# ENVIRONMENTAL COMPLIANCE SOLUTIONS, INC.

## Ethylene Oxide Mass Emissions Data and Calculations

### STERIS Isomedix Services - Waukegan, Illinois - May 15, 2008 Anguil Catalytic Oxidizer - Aeration

<u>DeltaP</u>	<u>SqRtDeltaP</u>	<u>Temp (F)</u>	<u>ppm EtO</u>	<u>stack ID =</u>	40	in.
<b>Run #1</b>						
0.25	0.5000	182	0.20	<u>stack area =</u>	8.73	sq. ft.
0.25	0.5000	183	0.08	<u>press =</u>	29.30	in. Hg
0.25	0.5000	186	0.13	<u>Tstd =</u>	528	deg R
0.25	0.5000	202	0.17	<u>Pstd =</u>	29.92	in Hg
0.25	0.5000	192	0.17	<u>Cp =</u>	0.99	
0.25	0.5000	210	0.05	<u>Kp =</u>	85.49	
0.25	0.5000	186	0.12	<u>Velocity =</u>	37.5	ft/sec
0.25	0.5000	210	0.01	<u>Flow =</u>	15031	dscfm
0.25	0.5000	184	0.10			
0.25	0.5000	193	0.14	<u>MWeto =</u>	44.05	
0.25	0.5000	201	0.04	<u>MolVol =</u>	385.32	
0.25	0.5000	186	0.10	<u>ppmv/ft3 =</u>	1000000	
<b>Run #2</b>						
0.25	0.5000	206	0.06	<u>EtO Mass Flow =</u>	0.000155	lbs/min
0.25	0.5000	182	0.12	<u>EtO Mass Flow =</u>	0.009310	lbs/hr
0.25	0.5000	190	0.13			
0.25	0.5000	186	0.05	<u>min/cycle =</u>	60	
0.25	0.5000	190	0.06	<u>cycles/yr =</u>	8760	
0.25	0.5000	211	0.09			
0.25	0.5000	189	0.07	<u>EtO Mass Flow =</u>	81.56	lbs/year
0.25	0.5000	208	0.11			
0.25	0.5000	179	0.09			
0.25	0.5000	210	0.16			
0.25	0.5000	189	0.07			
0.25	0.5000	188	0.07			
<b>Run #3</b>						
0.25	0.5000	205	0.11			
0.25	0.5000	179	0.10			
0.25	0.5000	207	0.01			
0.25	0.5000	183	0.08			
0.25	0.5000	206	0.15			
0.25	0.5000	213	0.25			
0.25	0.5000	185	0.09			
0.25	0.5000	205	0.08			
0.25	0.5000	184	0.11			
0.25	0.5000	200	0.08			
0.25	0.5000	199	0.01			
0.25	0.5000	188	0.12			
<b>Average =</b>						
0.25	0.5000	194.4	<b>0.0994</b>			
		=	654	degR		

# ETHYLENE OXIDE SOURCE TEST/CALIBRATION DATA

Client: Steris TsoMedix - Waukegan, IL  
 Source Tested: Anguil Catalytic Oxidizer Date: 5/16/08

## PRE CALIBRATION

	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO	1000 ppm EtO	10080 ppm EtO			
Inlet (FID)	Area Counts #1	3.63	33.7	359					
	Area Counts #2	3.41	34.7	359					
	Average Area	3.52	34.2	359					
	Audit Standard (48.8 ppmv) Result						50.1 ✓		
	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO					
Outlet (PID)	Area Counts #1	10.9	110	996					
	Area Counts #2	10.5	107	1050					
	Average Area	10.7	109	1020					
	Audit Standard (48.8 ppmv) Result						48.8 ✓		

(Aer.) Start: 1118    Run #1    1218    Run #2    1318    Run #3    1418  
(Aer.) Stop: 1218    1318    1418    P<sub>bar</sub>: 29.30    %H<sub>2</sub>O: 3    EtO Usage (lbs/yr): —  
Cycles Per Week: —

## POST CALIBRATION

	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO	1000 ppm EtO	10080 ppm EtO			
Inlet (FID)	Area Counts #1								
	Area Counts #2								
	Average Area		✓						
	Audit Standard (48.8 ppmv) Result						49.5 ✓		
	Calibration Gas Conc. (ppmv)	1.10 ppm EtO	10.1 ppm EtO	100 ppm EtO					
Outlet (PID)	Area Counts #1								
	Area Counts #2								
	Average Area		✓						
	Audit Standard (48.8 ppmv) Result						48.5 ✓		

*ECSi*

# ENVIRONMENTAL COMPLIANCE SOLUTIONS, INC. - VELOCITY TRAVERSE DATA

Client: STERIS Isomedix Services

Location: Waukegan, Illinois

Source: Anguil Catalytic Oxidizer

Run #: 1

Date: 5/16/2008

Port Sketch:

Probe Type: Std. Baro Press: 29.30  
Stack I.D.: 40 in. Static Press: -0.01



## Port 1

Inches From Port	Point#	Delta P				Stack Temp (F)	Cyclonic Angle	Point#	Delta P				Stack Temp (F)	Cyclonic Angle
		Low	High	Average	Sq Root				Low	High	Average	Sq Root		
1.3	1	0.23	0.23	0.23	0.4796	181	0	1	0.22	0.22	0.22	0.4690	182	0
4.2	2	0.23	0.24	0.235	0.4848	182	0	2	0.23	0.24	0.235	0.4848	183	0
7.7	3	0.25	0.26	0.255	0.5050	183	0	3	0.24	0.25	0.245	0.4950	183	0
13.0	4	0.27	0.28	0.275	0.5244	184	0	4	0.26	0.26	0.26	0.5099	183	0
27.0	5	0.27	0.27	0.27	0.5196	185	0	5	0.27	0.28	0.275	0.5244	184	0
32.3	6	0.25	0.25	0.25	0.5000	184	0	6	0.26	0.26	0.26	0.5099	184	0
35.8	7	0.24	0.25	0.245	0.4950	184	0	7	0.24	0.25	0.245	0.4950	184	0
38.7	8	0.23	0.23	0.23	0.4796	185	0	8	0.22	0.23	0.225	0.4743	184	0
	9							9						
	10							10						
	11							11						
	12							12						
	13							13						
	14							14						
	15							15						
	16							16						
	17							17						
	18							18						
	19							19						
	20							20						
	21							21						
	22							22						
	23							23						
	24							24						

Average Values: 0.2472 0.4969 183.4 0.0

**APPENDIX F**  
**Gas Certifications**



# Scott Specialty Gases

600 CAJON BLVD., SAN BERNARDINO, CA 92411

## CERTIFIED WORKING CLASS

*Single-Certified Calibration Standard*

Phone: 909-887-2571 Fax: 909-887-0549

### CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

#### Product Information

Project No.: 02-57164-001  
Item No.: 02020001310TCL  
P.O. No.: M/C L.COSTELLO  
  
Cylinder Number: CAL4448  
Cylinder Size: CL  
Certification Date: 26Mar2008

#### Customer

ENVIRONMENTAL COMPLIANCE SOLUTIONS I  
16305 SALIDA DEL SOL  
RAMONA, CA 92065

### CERTIFIED CONCENTRATION

<u>Component Name</u>	<u>Concentration (Moles)</u>	<u>Accuracy (+/-%)</u>
ETHYLENE OXIDE NITROGEN	1.10 PPM BALANCE	5

### TRACEABILITY

#### Traceable To

Scott Reference Standard

APPROVED BY:

MT

DATE:

3-27-08



# Scott Specialty Gases

300 CAJON BLVD., SAN BERNARDINO, CA 92411

## CERTIFIED WORKING CLASS

*Single-Certified Calibration Standard*

Phone: 909-887-2571 Fax: 909-887-0549

### CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

#### Product Information

Project No.: 02-57164-003  
Item No.: 02020001320TCL  
P.O. No.: M/C L.COSTELLO  
  
Cylinder Number: CLM003232  
Cylinder Size: CL  
Certification Date: 26Mar2008

#### Customer

ENVIROMENTAL COMPLIANCE SOLUTIONS I  
16305 SALIDA DEL SOL  
RAMONA, CA 92065

### CERTIFIED CONCENTRATION

<u>Component Name</u>	<u>Concentration (Moles)</u>	<u>Accuracy (+/-%)</u>
ETHYLENE OXIDE	10.1	5
NITROGEN	PPM BALANCE	

### TRACEABILITY

#### Traceable To

Scott Reference Standard

APPROVED BY:

*MT*

MT

DATE:

*3-26-08*



# Scott Specialty Gases

500 CAJON BLVD., SAN BERNARDINO, CA 92411

## CERTIFIED WORKING CLASS

*Single-Certified Calibration Standard*

Phone: 909-887-2571 Fax: 909-887-0549

### CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

#### Product Information

Project No.: 02-57164-004  
Item No.: 02020001330TCL  
P.O. No.: M/C L.COSTELLO

Cylinder Number: CLM011385  
Cylinder Size: CL  
Certification Date: 24Mar2008  
Expiration Date: 24Mar2010

#### Customer

ENVIRONMENTAL COMPLIANCE SOLUTIONS I  
16305 SALIDA DEL SOL  
RAMONA, CA 92065

### CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)	Accuracy (+/-%)
ETHYLENE OXIDE	100.	PPM
NITROGEN		BALANCE

### TRACEABILITY

#### Traceable To:

Scott Reference Standard

APPROVED BY:

B. McCully  
BLM

DATE: 3/21/08



# Scott Specialty Gases

500 CAJON BLVD., SAN BERNARDINO, CA 92411

# CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Phone: 909-887-2571 Fax: 909-887-0549

## CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

### Product Information

Project No.: 02-57164-005  
Item No.: 02020001340TCL  
P.O. No.: M/C L.COSTELLO

Cylinder Number: CLM002810  
Cylinder Size: CL  
Certification Date: 24Mar2008  
Expiration Date: 24Mar2010

### Customer

ENVIRONMENTAL COMPLIANCE SOLUTIONS I  
16305 SALIDA DEL SOL  
RAMONA, CA 92065

## CERTIFIED CONCENTRATION

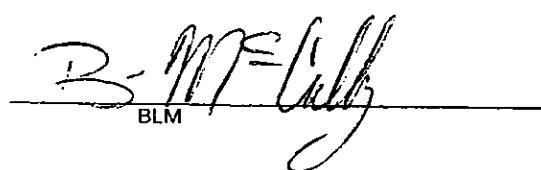
Component Name	Concentration (Moles)	Accuracy (+/-%)
ETHYLENE OXIDE	1,000.	PPM
NITROGEN		BALANCE 5

## TRACEABILITY

### Traceable To:

Scott Reference Standard

APPROVED BY:

  
BLM

DATE: 3/24/08



# Scott Specialty Gases

100 CAJON BLVD., SAN BERNARDINO, CA 92411

## CERTIFIED WORKING CLASS

*Single-Certified Calibration Standard*

Phone: 909-887-2571 Fax: 909-887-0549

### CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

#### Product Information

Project No.: 02-57164-006  
Item No.: 02020001340TCL  
P.O. No.: M/C L.COSTELLO

Cylinder Number: CLM005787  
Cylinder Size: CL  
Certification Date: 24Mar2008  
Expiration Date: 24Mar2010

#### Customer

ENVIRONMENTAL COMPLIANCE SOLUTIONS I  
16305 SALIDA DEL SOL  
RAMONA, CA 92065

### CERTIFIED CONCENTRATION

<u>Component Name</u>	<u>Concentration (Moles)</u>	<u>Accuracy (+/-%)</u>
ETHYLENE OXIDE	10,080.	PPM
NITROGEN		BALANCE

### TRACEABILITY

#### Traceable To

Scott Reference Standard

APPROVED BY:

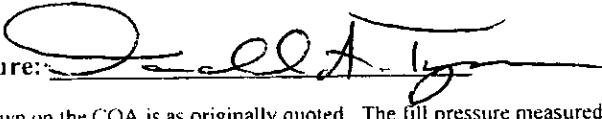
B. McGehee  
BLM

DATE: 3/24/08

**MESA****CERTIFICATE OF ANALYSIS**

Customer Name:	Environmental Compliance Solution	Cylinder Number:	SA25925
Stock or Analyzer Tag Number:	N/A	Product Class:	Certified Standard
Customer Reference:	Verbal- Dan	Cylinder - Contents <sup>1</sup> :	28 CF @ 2000 PSI
MESA Reference:	104448	Cylinder-CGA:	A006-HP-BR/350
Date of Certification:	3/24/2008	Analysis Method:	GC-TCD/FID
Recommended Shelf Life:	2 Years	Preparation Method:	Gravimetric

Component	Requested Concentration <sup>2</sup>	Reported Concentration <sup>2,3</sup>
Ethylene Oxide	50 ppm	48.8 ppm
Nitrogen	Balance	Balance

Authorized Signature: 

1. The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.
2. Unless otherwise stated, concentrations are given in molar units.
3. Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/256175/96. Reference Certification #'s: 163/W, 830/N and 3280. Calibration methods are in conformance with MIL-STD 45662A.

**MESA Specialty Gases & Equipment**

division of MESA International Technologies, Inc.

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On-line Catalog at [www.mesagas.com](http://www.mesagas.com)

**APPENDIX G**  
**Catalytic Oxidizer Temperature Data**

## CATALYST BED INLET TEMPERATURES DURING PERFORMANCE TESTING

Time	Catalyst Bed Inlet Temperature (Deg F)
11:16:00	325
11:21:00	325
11:26:00	325
11:31:00	325
11:36:00	325
11:41:00	325
11:46:00	325
11:51:00	325
11:56:00	325
12:01:00	325
12:06:00	325
12:11:00	325
12:16:00	325
12:21:00	325
12:26:00	325
12:31:00	325
12:36:00	324
12:41:00	325
12:46:00	325
12:51:00	325
12:56:00	325
13:01:00	324
13:06:00	325
13:11:00	325
13:16:00	325
13:21:00	325
13:26:00	324
13:31:00	325
13:36:00	325
13:41:00	325
13:46:00	324
13:51:00	325
13:56:00	324
14:01:00	324
14:06:00	325
14:11:00	324
14:16:00	325
14:21:00	324

